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AN ANALYTICAL EVALUATION OF THE CONTROLLABLE TWIST ROTOR PERFORMANCE AND DYNAMIC BEHAVIOR

By

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May 1972

EUSTIS DIRECTORATE
U. S. ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LABORATORY
FORT EUSTIS, VIRGINIA

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13. ABSTRACT

A detailed analytical evaluation is made of a new rotor system with torsionally elastic blades and dual controls - the controllable twist rotor (CTR). The controls consist of conventional pitch horn linkages at the inboard end and an aerodynamic control flap at the outboard end.

The analysis involves an aeroelastic loads digital computer program which was developed to account for the blade response modes and blade control modes on either single or dual control rotors. Six response modes are included: blade flapping, blade feathering, blade lagging, blade flapwise bending, blade torsion, and control flap feathering. The two control modes are included separately and incorporate control system stiffness so that control loads are calculated. The aeroelastic analysis includes nonlinear inertia distributions, nonlinear airfoil characteristics, and inertial and mechanical coupling among the modes. The analysis outputs transient responses for stability evaluation and steady-state blade load and angle-of-attack distributions, blade dynamics, and rotor performance for each trimmed flight condition.

Comparisons are made between a CTR and a conventional direct control rotor (DCR), using the above nonlinear aeroelastic loads analysis. Both are sized to meet an assumed utility helicopter mission. Conclusions resulting from this comparison show that the CTR has the following capability as compared to the DCR

30 percent decrease in solidity

15 percent reduction in power

18 percent increase in range

30 percent decrease in bending amplitudes (resulting in increased blade life)

15 percent lighter gross weight

10 percent smaller rotor diameter

25 percent lower installed power

15 percent less hover power (OGE, 4000 feet, 95°F)

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This report has been reviewed by the Eustis Directorate, U. S. Army Air Mobility Research and Development Laboratory, and is considered to be technically sound.

The purpose of the program was to analyze the performance improvement obtainable with the controllable twist rotor concept. The analysis techniques which were used are fully described in this report. The techniques appear to be reasonable for the purposes intended. Although final conclusions relative to this concept can be reached only as a result of adequate experimentation, the predicted performance gains for the controllable twist rotor can be viewed with sufficient confidence to encourage further investigation. This report is published for the dissemination of this data and for the stimulation of ideas relative to the basic subject.

The program was conducted under the technical management of Mr. W. E. Nettles of the Aeromechanics Division of this Directorate.

1C

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Final Report

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By

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Prepared by

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SUMMARY

A detailed analytical evaluation is made of a new rotor system with torsionally elastic blades and dual controls - the controllable twist rotor (CTR). The controls consist of conventional pitch horn linkages at the inboard end and an aerodynamic control flap at the outboard end.

The analysis involves an aeroelastic loads digital computer program which was developed to account for the blade response modes and blade control modes on either single or dual control rotors. Six response modes are included: blade flapping, blade feathering, blade lagging, blade flapwise bending, blade torsion, and control flap feathering. The two control modes are included separately and incorporate control system stiffness so that control loads are calculated. The aeroelastic analysis includes nonlinear inertia distributions, nonlinear airfoil characteristics, and inertial and mechanical coupling among the modes. The analysis outputs transient responses for stability evaluation and steady-state blade load and angle-of-attack distributions, blade dynamics, and rotor performance for each trimmed flight condition.

Comparisons are made between a CTR and a conventional direct control rotor (DCR), using the above nonlinear aeroelastic loads analysis. Both are sized to meet an assumed utility helicopter mission. Conclusions resulting from this comparison show that the CTR has the following capability as compared to the DCR:

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18 percent increase in range;

30 percent decrease in bending amplitudes (resulting in increased blade life);

15 percent lighter gross weight;

10 percent smaller rotor diameter;

25 percent lower installed power;

15 percent less hover power (OGE, 4000 feet, 95°F).

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FOREWORD

This report presents the work that was accomplished during the contract effort to analytically evaluate the blade aero-elastic characteristics and rotor performance of the controllable twist rotor. The report presents a description of the rotor, a detailed discussion of the analytical techniques developed herein, an evaluation and comparison of the CTR with conventional rotor systems, and a schematic of the control system kinematics. The computer analysis and control system schematic are on file at the USAAMRDL Eustis Directorate.

The research program was conducted by Kaman Aerospace Corporation under Contract DAAJ02-67-C-0068 (Task 1F162203A14302) and was carried out under the technical cognizance of Mr. William E. Nettles of the Eustis Directorate.

The research program began in July 1967 and was completed in March 1971. Personnel associated with the contract in addition to the authors were Messrs. D. W. Robinson, Jr., R. Jones, A. Berman, E. Walcek, and J. Kennedy.

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LIST OF SYMBOLS

[A]	linear operating matrix for multiplying with the acceleration matrix
a	blade section lift curve slope
A_o	collective pitch horn control input, deg
a_o	mean value of lift curve slope for use in Lock no. calculation
A_{1s}	lateral pitch horn control input, deg
a_{11}, a_{12}, etc	coefficients of Equation (50)
B	geometrical flapping rotation matrix
b	number of rotor blades
b_o, b_1, b_2, b_3	coefficients of Equation (51)
B_{1s}	longitudinal pitch horn control input, deg
c	blade chord
c_d	two-dimensional airfoil drag coefficient
c_ℓ	two-dimensional airfoil lift coefficient
c_{m_δ}	two-dimensional flap hinge moment. Trailing edge down is positive
c_{m_θ}	two-dimensional airfoil pitching moment coefficient about the 1/4 chord. Nose up is positive
c_q	damping coefficient for the dissipative function in elastic bending, in.-lb/in./sec
c_{tw}	damping coefficient for the dissipative function in elastic torsion, in.-lb/deg/sec
CTR	designation for the Controllable Twist Rotor
c_β	damping coefficient for the flapping motions, in.-lb/deg/sec

c_ζ	damping coefficient for the lag motions (lag damper), in.-lb/deg/sec
c_θ	damping coefficient for the feathering motions (pitch damper), in.-lb/deg/sec
Δc	distance from blade trailing edge to flap trailing edge, in.
c_o	mean blade chord used for Locke no. or solidity calculation, in.
c_o, c_1, c_2, c_3	coefficients of Equation (57)
$c_{11}, c_{12}, c_{13} \ldots c_{nn}$	inertial coefficients of the linear equations of motion
D	blade section drag force parallel to the local relative air velocity, lb
DCR	designation for the Direct Control Rotor
d_o, d_1, d_2, d_3	coefficients of Equation (51)
E_1, E_2	geometrical transfer matrix for the flapping and lag offset hinges
e_1	flapping hinge offset distance, in.
e_2	lag hinge offset distance, in.
e_3	distance from feathering axis to flap hinge line, in.
$[F]$	forcing function matrix
f	helicopter equivalent drag area defined by $D = \frac{1}{2} \rho V^2 f$, ft^2
$[F_{NL}]$	nonlinear forcing function matrix
F_x	rotor force parallel to the flight path, lb
F_y	rotor lateral force normal to the flight path. Positive to the left

F_z	rotor force normal to flight path in the vertical direction. Often equivalent to the gross weight, lb
GW	helicopter gross weight, lb
HP	rotor shaft horsepower, horsepower
H_s	longitudinal force in the shaft plane. Positive aft
I	when subscripted numerically indicates one of the many inertial integrals as defined in the appendix
i	blade running feathering inertia, lb-in.^{2}/in.
$[I_L]$	linear inertial matrix
$[I_{NL}]$	nonlinear inertial matrix
$I_{\theta tw}$	integral of mass when multiplied by the square of the mode shape results in the torsional inertia, lb-in.^{2}
I_1	blade flapping inertia about the flapping hinge, lb-in.^{2}
K_β	flapping spring rate, in.-lb/deg
K_δ	spring rate for the flap, in.-lb/deg
$K_{\delta\beta}$	flapping to flap feedback coefficient
$K_{\delta\zeta}$	lag to flap feedback coefficient
$K_{\delta\theta}$	feathering to flap feedback coefficient
K_ζ	lag spring, in.-lb/deg
K_θ	feathering root spring, in.-lb/deg
$K_{\theta\beta}$	flapping to feathering feedback coefficient
$K_{\theta\zeta}$	lag to feathering feedback coefficient
k	iteration count for computer analysis

L	blade section lift force normal to the local relative air velocity, lb
L/D	blade section lift to drag ratio
$[L_L]$	linear airload matrix
$[L_{NL}]$	nonlinear airloads matrix
M	when subscripted numerically, indicates one of the many mass integrals as defined in the appendix
M_θ	aerodynamic pitching moment on blade section. Nose up is positive, in.-lb
M_δ	aerodynamic flap moment trailing edge down is positive about the flap hinge, in.-lb
N	number of iterations required for convergence
OGE	out-of-ground effect
P	geometrical transfer matrix from point on blade to flapping hinge
$[P]$	linear periodic response matrix
Q	geometrical transfer matrix for the elastic bending
q_M	maximum elastic bending amplitude at the blade tip. Peak-to-peak value, in.
Q_s	rotor torque, in.-lb
q_1	blade elastic bending response of the first bending mode measured up from the rigid blade at the tip, in.
R	rotor radius, in.
r	radial position along rotor blade, in.
S	when subscripted numerically, indicates one of the many static moment integrals as defined in the appendix

S_j	generalized coordinate tensor
T_s	rotor thrust, lb
T_{max}	maximum thrust at rotor stall, lb
T_{11}, T_{12}, $T_{13} \ldots T_{nn}$	aerodynamic coefficients of the linear equations of motion
U	resultant blade element relative air velocity, in./sec
$\bar{U}$	nondimensional blade element relative air velocity
U_p	component of total blade element relative air velocity normal to the shaft plane, in./sec
U_t	component of total blade element relative air velocity parallel to the shaft plane, in./sec
$\bar{U}_{t_o}$	nondimensional tangential relative air velocity in the shaft plane
U_1, U_2	strain energy for the blade and flap mass elements
V	forward speed, knots
V_t	velocity of generalized coordinate system in the earth reference, in./sec
V_x, V_y, V_z	components of helicopter forward speed, in./sec
w	blade running weight, lb/in.
X	rotor coordinate in shaft plane measured aft, in.
x	nondimensional radial station
x_{cg}	chordwise cg position from feathering axis positive forward, in.

LIST OF SYMBOLS (Continued)

Y	rotor coordinate in shaft plane measured to the right, in.
Y_s	lateral force in the shaft plane positive to the right, lb
Z	geometrical lag rotation transfer matrix
z	rotor coordinate system in shaft plane measured up
α	angle of attack of blade element with relative air velocity, deg
α_{max}	maximum blade section angle of attack, deg
α_s	shaft forward inclination with respect to the vertical, deg
α_{tip}	tip angle of attack, deg
$\alpha_{\theta m}$	airfoil angle of attack with zero pitching moment about the 1/4 chord, deg
α_{72}	angle of attack at the 72% radius, deg
β	flapping response measured up from the shaft plane, deg
β_o	zero position of the flapping spring, deg, rad
$\Gamma_1, \Gamma_2, \Gamma_3$, etc	inertial terms used in the nonlinear equations
γ	blade Lock number defined by $\frac{c_o \rho_o a_o R^4}{I_1}$
δ	response of the flap measured positive with the trailing edge down, deg
δ_c	collective flap input, deg
δ_{in}	net flap control input, deg
δ_o	zero position for the flap spring, deg

LIST OF SYMBOLS (Continued)

δ_{1c}	lateral flap control input
δ_{1s}	longitudinal flap input, deg
δ_{2s}, δ_{2c}	sine and cosine second-harmonic flap control input, deg
ζ	lag response positive counter-clockwise looking down on the rotor, deg
ζ_o	zero position for lag spring, deg
η_z	vertical load factor in steady flight
Ξ	geometrical transfer matrix for the feathering rotation
θ	rigid body feathering displacement measured leading edge up from the shaft plane, deg
θ_c	collective pitch horn control (equivalent of A_o in pitch horn control input series), deg
θ_{in}	net pitch control input, deg
θ_{tw}	blade elastic twist displacement at blade tip, deg
x	geometrical transfer matrix for the built-in twist rotation
θ_x	built-in blade twist with wash-out having a negative sense, deg
θ_o	zero position for feathering spring, deg, rad
θ_{1c}	lateral pitch horn control (equivalent of A_{1s} in pitch horn control series), deg
θ_{1s}	longitudinal pitch horn control (equivalent of B_{1s} in pitch horn control input series), deg
θ_{2s}, θ_{2c}	sine and cosine components of the second harmonic pitch horn control input, deg

LIST OF SYMBOLS (Continued)

λ	mean value of rotor inflow normal to the shaft plane positive up through the rotor
μ	rotor advance ratio defined by $\mu = \dfrac{V\phi\alpha_s}{\Omega R}$
ξ_a	distance from the feathering axis to the aerodynamic center, in.
ξ_δ	distance from flap hinge to center of pressure on the flap, in.
ξ_1	chordwise distance from the feathering axis to an element of blade mass, in.
ξ_2	chordwise distance from the flap hinge to an element of flap mass, in.
ρ	ambient air density, slugs/ft^3
ρ_o	sea level standard air density, slugs/ft^3
ρ/ρ_o	air density value divided by the sea level standard value
σ	rotor solidity value
ϕ_r	amplitude of the one-per-rev elastic twist response at the blade tip, deg
Φ_{tw}	geometrical transfer matrix for the elastic twist rotation
ϕ_{tw}	elastic twist displacement mode shape generally having the value of unity at the blade tip
ϕ_v	angle of local relative blade element air velocity, deg
ϕ_o	collective elastic twist response of the blade tip, deg
ϕ_{1c}	cosine component of the one-per-rev elastic twist, tip deflection

LIST OF SYMBOLS (Continued)

ϕ_{1s}	sine component of the one-per-rev elastic twist tip deflection, deg
χ_i	generalized coordinate of the i-th mass, in.
$\dot{\chi}_i$	velocity in the generalized coordinate system of the i-th mass, in./sec
$\ddot{\chi}_i$	acceleration in the generalized coordinate system of the i-th mass, in./sec^2
$[\ddot{\chi}]$	linear acceleration matrix
ψ	blade azimuth position, measured counter-clockwise from the aft position looking down on the rotor, deg
ψ_ϕ	azimuthal phase position of the one-per-rev elastic twist response, deg
Ω	rotor rotational speed, rad/sec
ω	nonrotating bending frequency for the first elastic flatwise mode, cycles/sec
ω_{tw}	nonrotating elastic torsional frequency, cycles/sec
ΩR	rotor tip speed, ft/sec, in./sec
dp_i	external force element for the evaluation of virtual work in the Lagrangian equations of motion
Δc	flap chord, in.
Δp	blade foreshortening term due to elastic bending, in.
$\partial U_1/\partial s_j$, $\partial U_2/\partial \dot{s}_j$	derivative of the strain energy and the dissipative energy with respect to the generalized coordinate system

LIST OF SYMBOLS (Continued)

dm	mass element for blade and flap, slugs
$\partial \chi_i / \partial s_j$	derivative of the position tensor with respect to the generalized coordinate
dW_2/ds_j	expression for virtual work in the equations of motion
Q_j	expression for generalized forces in the Lagrangian equations of motion
Ξ_1	geometrical transfer matrix for chordwise offset of blade mass element from elastic axis
Ξ_2	geometrical transfer matrix for chordwise offset of flap mass element from flap hinge line
$¢_{(angle)}$	symbol for the cosine of an angle
$\$_{(angle)}$	symbol for the sine of an angle
'	prime denotes derivative with azimuth
''	double prime indicates the second derivative with azimuth
$\dot{}$	dot indicates the first derivative with time
$\ddot{}$	double dot indicates the second derivative with time
—	bar indicates division by $I_1\Omega^2$

BACKGROUND

Helicopter rotors are sized to meet load factor and maneuverability (agility) requirements at various flight conditions specified by the user. Whether a rotor is designed for a small observation helicopter, a utility transport helicopter, an armed fire suppression helicopter, or a heavy-lift helicopter, rotor diameter and solidity are determined by the required operating extremes of the flight envelope that are specified. Rotors are not sized by cruise speed conditions of the vehicle.

Most of today's helicopters are constrained at their extreme flight conditions by two sets of problems. First are the basic aerodynamic problems associated with compressibility and blade stall. Rotor systems can tolerate only small portions of the disk operating near the maximum angle of attack on the retreating side and in supercritical flow on the advancing side. Second are the problems associated with the necessity to trim the helicopter and to provide stability and control. Because there is a unique set of control inputs required to trim conventional rotors at each flight condition, little can be done to alter the airload distribution for fixed-geometry rotors. As a result of these two sets of constraints, the greater portion of the disk is lightly loaded. Therefore, it is necessary to resort to high blade solidity in order to satisfy the requirements of the flight envelope.

The high solidity conventional rotor designed for the extreme conditions is overdesigned at hover where more nearly uniform load distributions are generated. The hover performance of the high solidity rotor is less than optimum because of the increased parasite drag resulting from unnecessary blade area and because the low blade section angles of attack are far from the maximum L/D angles.

In addition to the performance problem in sizing the rotor, there is the problem associated with dynamic loading and vibration. In conventional rotor design, alleviation of blade stresses, fuselage vibration and control loading can only be accomplished in the structural design of the blade itself. Even then, only limited improvements are possible and other constraints such as static droop, aerodynamic section characteristics, manufacturing processes, etc., limit the changes possible.

Having recognized that these problems exist in conventional rotor design, it is axiomatic that if blade stall and compressibility problems are alleviated, rotor solidity can be reduced. This reduction will decrease profile power, thereby improving the total rotor performance picture.

One viable approach to the alleviation of the blade stall and compressibility problems is through proper redistribution of blade airloads. This, in turn, may be accomplished by proper distribution of blade twist.

Fixed built-in twist is in common usage in helicopter design, and the effects of blade built-in twist on power requirements, vibratory loads, stall characteristics, and compressibility effects of fully articulated and hingeless rotor systems have been analyzed quite extensively for various helicopter configurations. Reference 1 contains the results of some of these analyses. One of the primary conclusions reported in Reference 1 states that blade twist is an extremely important parameter of rotor performance and blade stresses. A direct quote of this statement is presented in the following paragraph.

> "Blade twist was found to be a significant variable for control of blade stresses and rotor performance. Increased negative twist acts to unload the retreating and load the advancing blade. Due to the helicopter's pitch-trim requirements, the advancing blade must carry the increased load on the inboard panels rather than the more efficient outboard panels. The resulting one-per-rev load dissymmetry is the aerodynamic cause of increased blade vibratory stress....Results of calculations for planform-twist variation indicate a rapid rise in vibratory bending moments with increase in blade twist for rigid and articulated rotor systems. Small values of negative twist resulted in minimum blade stress, while the optimum power-twist tradeoff required larger values of negative twist....For the aircraft considered, blade twist to minimize stress was found to be in the region of +2° to -2°. Optimum power for helicopters was found in the region of -8° twist....".

Other more recent analyses which have been performed as part of preliminary design studies have indicated that the twist for optimum figure of merit may be even higher than that reported in Reference 1. Although these studies have not been documented, values as high as -16° have been commonly discussed and are likely to represent the twist required for optimum efficiency in hover.

These results indicate that high negative blade twist yields minimum power requirements at hover and low speed, whereas low negative blade twist yields minimum vibratory loads at high forward speeds. Therefore, the built-in twist in conventional rotor design must be a compromise which will produce satisfactory performance and dynamic loads but which does not represent the optimum for either.

In addition to the benefits which can be derived from built-in twist, a qualitative evaluation of the Reference 1 results suggests that decreased negative twist on the advancing blade and increased negative twist on the retreating blade further decrease vibratory loads at high forward speeds. Consequently, this evaluation suggests a variable-geometry rotor blade which has the ability to collectively vary its twist with forward speed and to cyclically vary its twist with azimuth.

In order to investigate this hypothesis, wind tunnel tests were conducted with a torsionally-segmented model helicopter rotor. This rotor consisted of a two-panel blade with each panel controlled independently in order to simulate the desirable characteristics of a variable-geometry blade. The test results are reported in Reference 2. Despite the hardware problems encountered in designing the two-panel blade, and the drag penalties incurred by blade panel discontinuity, the maximum propulsive force measured for the segmented rotor was more than nine times that for the corresponding conventional rotor. In summary, the aerodynamic principle was established for a variable-geometry rotor with variable pitch schedules along the radius and around the azimuth.

A recent analysis has been made of the variable-geometry blade requirements which would redistribute airloads so as to yield minimum vibratory hub shears. This analysis, reported in Reference 3, shows that blade twist is a primary parameter in providing the proper airload distribution for minimizing shears. The conclusions state that a torsionally flexible blade with dual control inputs at the blade root and tip can provide significant improvements over existing conventional rotor systems.

THE CONTROLLABLE TWIST ROTOR

SYSTEM DESCRIPTION

The controllable twist rotor (CTR), as shown in Figure 1, was conceived as a practical system by which blade twist distribution can be controlled both cyclically and collectively. The system is intended to satisfy the twist requirements as stated in Reference 1 by allowing the selection of a high negative twist in hover and progressively lower negative twist as forward speed is increased. The CTR also satisfies the recommendations of Reference 2 for improving performance and Reference 3 for reducing hub shears by allowing the selection of a cyclic twist distribution.

CTR consists of an articulated torsionally flexible blade that is controlled by a conventional pitch horn (direct control) linkage at its root and an aerodynamic control flap at its tip. For this study, the pitch horn device is considered the primary trim control system for vectoring rotor thrust magnitude and direction. The flap generates the necessary external moments for elastically twisting the blade about its mean trim position in order to provide an efficient distribution of blade airloads. The flap also provides a means for varying the blade tip section camber line, thereby resulting in an uncambered airfoil section on the advancing side and a high lift airfoil section on the retreating side.

Figure 1 illustrates the dual control system independently actuated by two separate swashplates. Both the primary and secondary control systems can be varied collectively and/or cyclically. Each can also be scheduled to vary with forward speed. Design methodology for the linkage mechanisms of the dual control system and for the torsionally elastic blade utilizes existing technology from proven flightworthy hardware now in service use.

It is conjectured that a fixed relationship between the otherwise independent controls may provide optimum rotor performance and blade dynamics for a specific helicopter configuration. If such a relationship exists, the control system can be simplified through the use of a single swashplate.

Extremely large rotors operate in a reduced centrifugal force field. Consequently, a second alternative actuating system for large rotors would use a swashplate for the pitch horn and a fly-by-wire electromechanical actuator for the flap.

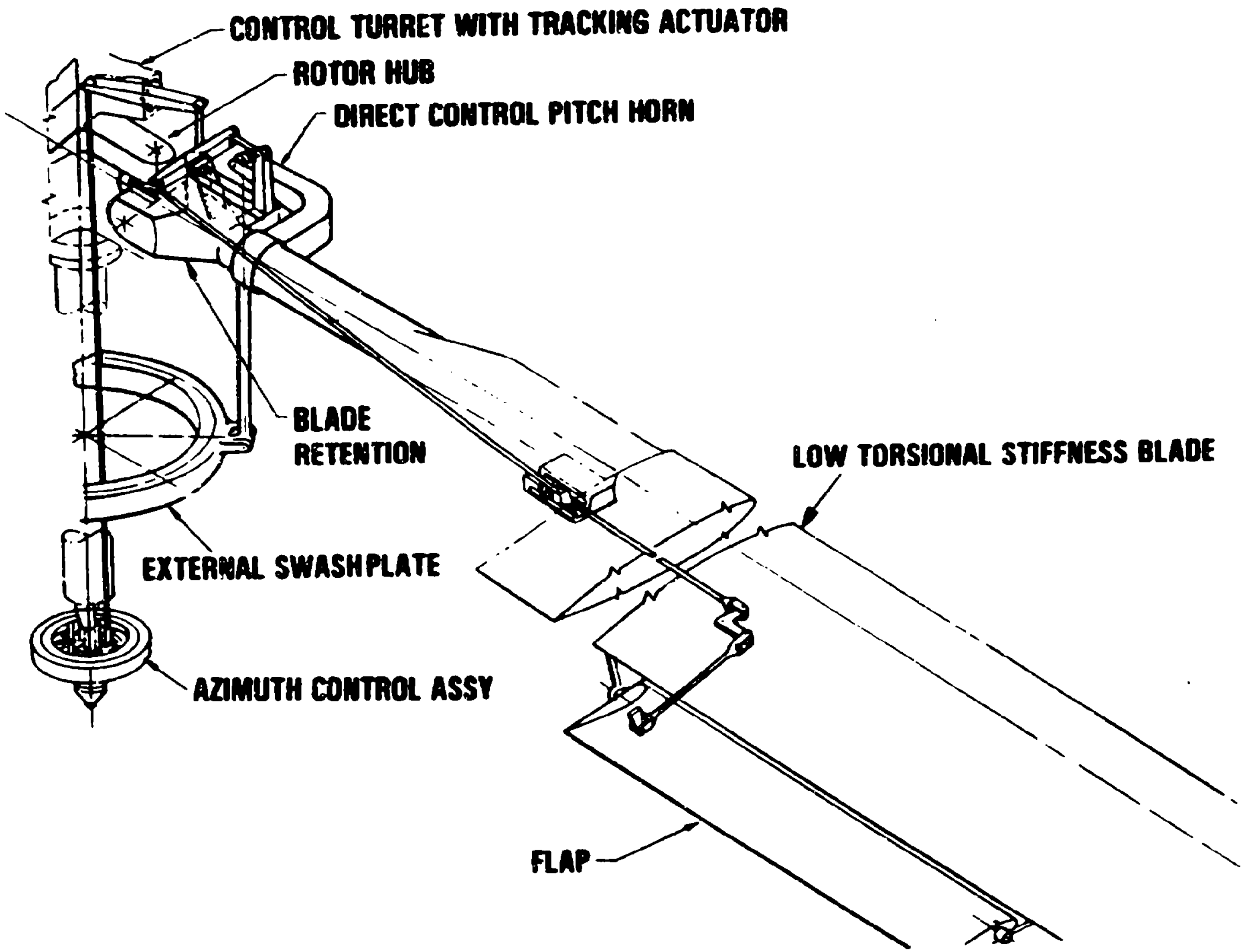


Figure 1. Control Arrangements for the Controllable Twist Rotor.

The electromechanical actuator would be installed in the blade and could be used as a tuning ballast weight. Because it would be driven electrically, the input signal waveform to the flap could be controlled to include various amplitudes and phasings of higher harmonics.

MODES OF OPERATION

If independent swashplates are used, the controllable twist rotor is anticipated to have the capability of generating the required trim forces for any flight condition through a continuous range of control input combinations. It can be flown with pure pitch horn control and no flap input or, at the opposite extreme, with pure flap control and no pitch horn input. Different combinations of the two inputs produce various steady and periodic twist distributions on the blade, and various combinations of radial and azimuthal variations in angles of attack. Thus, there is every reason to expect that it is possible, through control input alone, to redistribute the loading at forward speed so as to substantially increase the average blade loading at constant peak loads, thereby reducing the solidity, weight, and power requirements, compared to a direct control rotor.

In addition to reducing the required solidity, it is conjectured that the smoothing of the airload distribution achieved by the CTR increases aerodynamic efficiency and reduces the vibratory components,resulting in lower vibratory blade stresses, hub shears, and control loads. The lower blade stresses would provide increased blade life. Reduced vibratory hub shears, resulting in lower fuselage vibration levels and stresses, would reduce the weight of added structure required for fatigue reliability and would reduce the weight of vibration alleviation devices required for personnel efficiency and comfort and equipment reliability. Increased blade efficiency automatically would improve hover and lifting capability. The inboard and outboard controls of the CTR system will provide a degree of control over rotor vibration.

ANALYTICAL METHODS

EQUATIONS OF MOTION

The analysis used to evaluate the CTR and the direct controlled rotor is an extension of the analysis developed in Reference 4, where the method of solution and the coupled aeroelastic equations of motion are derived for five response modes and two control modes for a fully articulated rotor system. The CTR has an added degree of flexibility derived from the elastic twist displacements. Consequently, the elastic twist degree of freedom has been added to make the present analysis descriptive of six response modes and two input control modes. The response modes can be considered normal modes and are described as follows:

- Blade Pitching
- Blade Lagging
- Blade Flapping
- Blade Flapwise Bending (First Elastic Bending Mode)
- Blade Twisting (First Elastic Twisting Mode)
- Flap Pitching

Figure 2 shows the displacements associated with the response modes.

The derivation of the equations of motion and basic method of solution have been reported in detail in References 4 and 5. They are discussed in the present report only to the extent that a general understanding of the problem is developed.

The modal approach is used to evaluate the airloads on a fully articulated rotor by mathematically describing blade motions with the listed six degrees of freedom. The complete inertial and centrifugal terms for the equations of motion are derived through the use of matrix transformations. Potential strain energy and dissipative energy terms are included in the equations of motion by assuming concentrated springs and viscous dampers for the four rigid body modes, and by evaluating the fundamental bending and torsional frequencies of the rotating blade for the flapwise bending and torsion modes.

Generalized aerodynamic forces for each of the six modes are obtained from strip theory by calculating an instantaneous local airfoil section angle of attack and using this angle of attack to evaluate aerodynamic force coefficients from available wind tunnel data. Derivations of the equations of motion and of the generalized forces are presented in Appendix I.

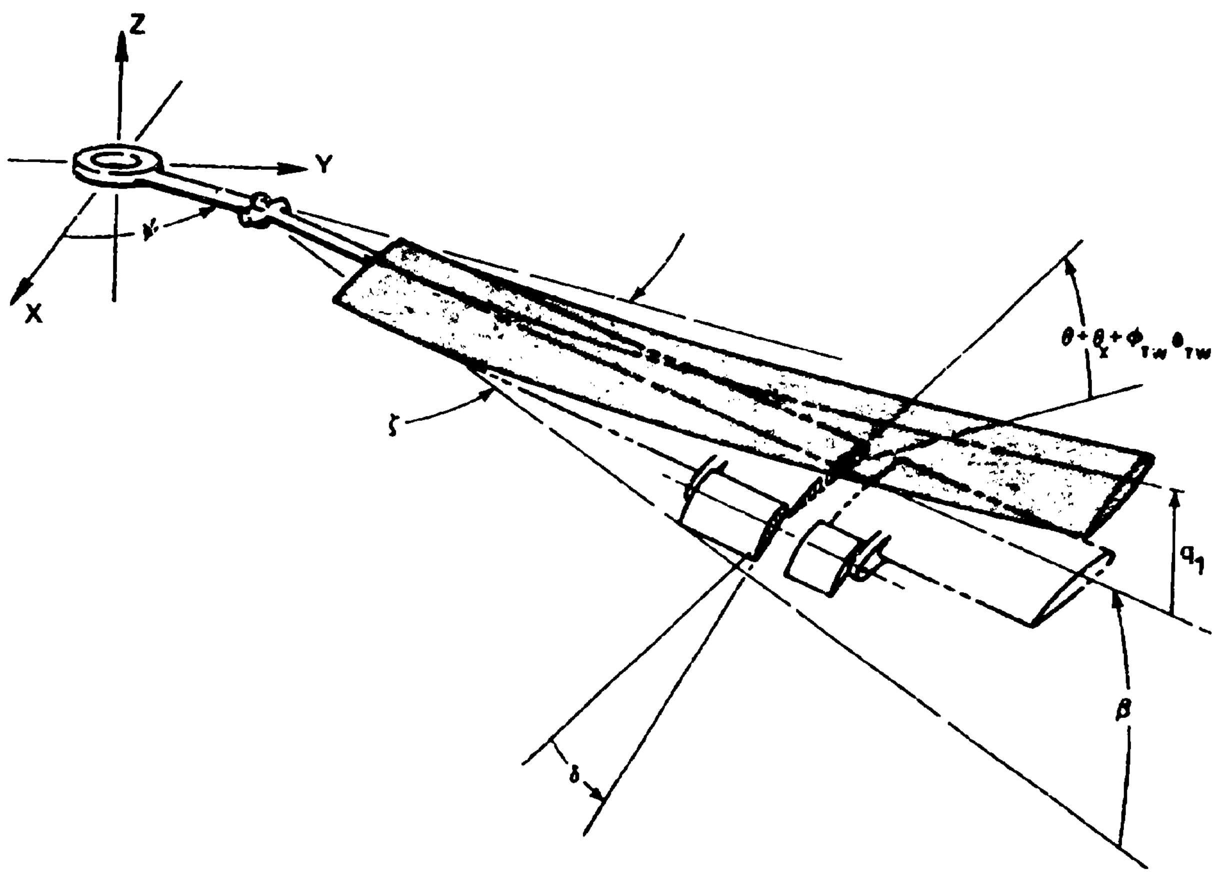


Figure 2. Controllable Twist Rotor Displacements.

Because of the modes included in the analysis, these equations can be used to analyze articulated rotors controlled directly with pitch horns, articulated rotors controlled aerodynamically with flaps, articulated rotors with dual controls, hingeless rotors controlled by pitch horns, hingeless rotors controlled by flaps, or hingeless rotors with dual controls.

In their present form, the aeroelastic equations of motion include all nonlinear inertial coupling effects and nonlinear aerodynamic effects such as reverse flow, stall, Mach number variations and large induced flow angles. The present study used uniform inflow because of computer capacity and time limitations. However, the variable inflow calculations are treated as a subroutine in the overall aeroelastic loads computer program and, as such, can be modified to incorporate any of the published methods.

Additional features to the analysis are the inclusion of feedback mechanical coupling among the flap, blade feathering, blade flapping, and blade lagging motions and the inclusion of arbitrary spring rates and dampers for each mode. Any one or combination of these parameters can be eliminated easily from the analysis. Furthermore, spring rates for the two types of control systems are also included in order that accurate control loads can be calculated.

As previously mentioned, the flexible twist degree of freedom is necessary to properly describe the mathematical model of the CTR. It was found more convenient to add this new degree of freedom to the existing methods of solution described in Reference 4, rather than to rederive a complete new set of nonlinear equations. This is primarily due to similarities between the feathering equation and the twisting equation which allow the almost direct substitution, of new terms containing the twist parameter, into the feathering equation. Thus, a new equation is created for twist. The justification for this procedure lies in the fact that the radial integrations of the linear inertial terms for the feathering equations are identical to those of the twist degree of freedom when modified by the twist mode shape. However, before proceeding with further development of the equations, it is necessary to obtain an understanding of the mechanism of twist and how it is applied in a modal analysis.

The twist energy must satisfy a balance such that it may be applied to the Lagrangian equations of motion for the jth generalized coordinate as established in Reference 4.

$$\iiint \ddot{\chi}_i (\partial \chi_i / \partial s_j) dm + \partial U_1 / \partial s_j + \partial U_2 / \partial \dot{s}_j = \iint (\partial \chi_i / \partial s_j) dp_i \qquad (1)$$

where the strain energy

$$U_1 = U_1(s_j) \tag{2}$$

and the dissipative energy

$$U_2 = U_2(\dot{s}_j) \tag{3}$$

As in Reference 4, a point on the flap is given by

$$\chi_2 = V_t + \Psi\ E_1 + Z\{E_2 + B[P + \Phi_{tw}\Theta\ \Theta_x(Q + E_3 + \Delta\Xi_2)]\} \tag{4}$$

and a point on the blade is given by

$$\chi_1 = V_t + \Psi[E_1 + Z\{E_2 + B[P + \Phi_{tw}\Theta\ \Theta_x(Q + \Xi_1)]\} \tag{5}$$

where the transformation matrices are defined in Appendix I. The evaluation of $\ddot{\chi}_i(\partial\chi_i/\partial s_j)$ and $(\partial\chi_i/\partial s_j)dp_i$ will produce terms in twist that are similar to the terms in pitch since twist terms appear everywhere that pitch terms appear, and derivatives with respect to twist are similar to the derivatives with respect to pitch. The twist rotation as defined in Appendix I is

$$\Phi_{tw} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \text{¢}_{\phi_{tw}\theta_{tw}} & -\$_{\phi_{tw}\theta_{tw}} \\ 0 & \$_{\phi_{tw}\theta_{tw}} & \text{¢}_{\phi_{tw}\theta_{tw}} \end{bmatrix} \tag{6}$$

where ϕ_{tw} is the elastic twist mode shape and θ_{tw} is the twist tip deflection.

In linear form, using small angle assumptions, Equation (6) becomes

$$\Phi_{tw} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & -\phi_{tw}\theta_{tw} \\ 0 & \phi_{tw}\theta_{tw} & 1 \end{bmatrix} \tag{7}$$

As in Reference 4, the linear pitch rotation is given as

$$\Theta = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & -\theta \\ 0 & \theta & 1 \end{bmatrix} \tag{8}$$

Evaluating Equation (1) for the pitch degree of freedom and for the twist degree of freedom using Equations (4) through (8), the integrated inertial terms in twist are identical to those in pitch except that twist is modified by the twist mode shape. The twist acceleration, velocity, and displacement terms in the twist equation are modified by the square of the mode shape because these terms result from second derivatives of twist and/or products of derivatives and twist. Similar results are obtained for the linear aerodynamic forcing functions.

Direct substitution of the twist tip deflection mode shape into the feathering equation produces the twist equation to be added to the five-degree-of-freedom system reported in Reference 4. The matrix transformations, the six nonlinear response equations, and the corresponding radial and chordwise inertial integrations of masses, first moments, and second moments of inertia are listed in Appendix I.

The portion of potential or strain energy, U_1, that is attributed to elastic twist can be defined as

$$(U_1)_{twist} = 1/2\ I_{\theta_{tw}} \omega_{tw}^2 \phi_{tw}^2 \theta_{tw}^2 \tag{9}$$

Equation (9) is the torsional response equation for a bar of uniform torsional stiffness (Reference 4), the assumption being made that the rotor blade has a uniform torsional stiffness. This strain energy is derived in a nonrotating system; therefore, the natural response frequency, ω_{tw}, is the natural frequency of the blade for the first nonrotational mode; ϕ_{tw} is the associated mode shape. $I_{\theta_{tw}} \phi_{tw}^2$ is the torsional inertia of the blade, and since the mass of the flap contributes to this inertia, it is defined as follows:

$$\phi_{tw}^2 I_{\theta_{tw}} = e_3^2 M_{33} + I_{18} - 2e_3 S_{52} + I_{41} \tag{10}$$

where the various terms are defined in Appendix I. From Equations (9) and (10) and Reference 4, the total strain energy becomes

$$U_1 = 1/2\ K_\beta(\beta - \beta_o)^2 + 1/2\ K_\theta(\theta - \theta_o)^2 + 1/2\ K_\zeta(\zeta - \zeta_o)^2$$

$$+ 1/2\ K_\delta(\delta - \delta_o)^2 + 1/2(M_4 + M_{20})\omega^2 q_1^{\ 2} + 1/2\ K_{\theta_{in}}(\theta - \theta_{in})^2$$

$$+ 1/2\ K_{\delta_{in}}(\delta - \delta_{in})^2 + 1/2(e_3^{\ 2}M_{33} + I_{18} - 2e_3 S_{52}$$

$$+ I_{41})\omega_{tw}^{\ 2}\theta_{tw}^{\ 2} \tag{11}$$

The dissipative function due to elastic twist results from structural damping and can be described approximately as

$$(U_2)_{twist} = 1/2\ C_{tw}(\theta'_{tw})^2 \tag{12}$$

where the prime denotes the derivate with azimuth. From Reference 4 and Equation (12), the total dissipative function is

$$U_2 = 1/2\ C_\beta(\beta')^2 + 1/2\ C_\zeta(\zeta')^2 + 1/2\ C_\theta(\theta')^2$$

$$+ 1/2\ C_q(q_1')^2 + 1/2\ C_\delta(\delta')^2 + 1/2\ C_{tw}(\theta'_{tw})^2 \tag{13}$$

In Equations (11) and (13), K_ζ, K_β, K_θ, K_δ and C_ζ, C_β, C_θ, C_δ represent the spring stiffness constants and the viscous damping constants, respectively. Initial tension in the springs is removed by indexing the angular deflections through the angles ζ_o, β_o, θ_o, δ_o. The first flapwise bending mode, its natural frequency, and the effective mass associated with this mode are denoted by q_1, ω, and $(M_4 + M_{20})$ in Equation (11). The derivatives of the strain function and the derivatives of the dissipative function with respect to the various degrees of freedom, $\partial U_1/\partial s_j$ and $\partial U_2/\partial \dot{s}_j$, have been evaluated and are combined with the proper inertia coefficients in Appendix I.

The surface forces acting on the rotor blade and flap consist of the aerodynamic forces and moments which can be separated into steady and unsteady components. As mentioned previously, Equation (1) represents the condition of dynamic equilibrium of the moments for each degree of freedom. Consequently, the generalized forces for these equations will be given by moments which account for the appropriate boundary conditions in each mode. The generalized forces that appear in Equation (1) can be written in terms of the virtual work done by the external forces.

$$Q_j = \iint \frac{\partial x_i}{\partial s_j}\, dp_i = \frac{dW_2}{ds_j} \qquad (14)$$

Equation (14) is not in a convenient form for use with the equilibrium equations, because it is written in terms of pressures rather than the more common aerodynamic lift, drag, and pitching moment distributions along the blade.

The generalized forces can be expressed in terms of these aerodynamic parameters by applying the distributed loads along the blade and allowing the blade to undergo a virtual displacement in each mode. When this is done, expressions for each Q_j can be written as follows:

$$Q_\zeta = \int [L\$_{\phi_v} + D¢_{\phi_v}](r - e_1)dr$$

$$Q_\beta = \int [L¢_{\phi_v} - D\$_{\phi_v}](r - e_2)dr$$

$$Q_\Theta = \int M_\Theta dr$$

$$Q_{q_1} = \int [L¢_{(\Theta + \Theta_x - \phi_v)} + D\$_{(\Theta + \Theta_x - \phi_v)}]\phi dr$$

$$Q_{\Theta_{tw}} = \int M_\Theta \phi_{tw} dr$$

$$Q_\delta = \int M_\delta dr \qquad (15)$$

Detailed expressions for the generalized forces are given in Appendix I. Figures 3, 4, and 5 illustrate the blade airfoil cross-section geometry, the section aerodynamic force, moment, and velocity vectors, and the blade generalized forces.

The present analysis describes the behavior of articulated rotors with pitch control input, with flap control input, or with dual control input. The feathering input is given by

$$\Theta_{in} = \Theta_c - \Theta_{1s}\$_{\psi} - \Theta_{1c}\text{\textcent}_{\psi} - \Theta_{2s}\$_{2\psi} - \Theta_{2c}\text{\textcent}_{2\psi} + K_{\Theta\beta}\beta + K_{\Theta\zeta}\zeta \tag{16}$$

The flap input is given by

$$\delta_{in} = \delta_c + \delta_{1s}\$_{\psi} + \delta_{1c}\text{\textcent}_{\psi} + \delta_{2s}\$_{2\psi} + \delta_{2c}\text{\textcent}_{2\psi} + K_{\delta\beta}\beta + K_{\delta\Theta}\Theta + + K_{\delta\zeta}\zeta \tag{17}$$

In Equations (16) and (17), the various azimuthal coefficients correspond to collective, cyclic, and second harmonic inputs; the constants correspond to the mechanical feedback couplings among the modes.

METHOD OF SOLUTION

Generally, nonlinear response equations are solved by numerical methods for computer adaptation. Most often, these solutions use a forward integration approach, which requires a knowledge of initial conditions in order to precipitate the solution (initial value problem). Experience has shown, however, that an estimate of the initial conditions can be so far from the steady-state solution of a multi-mode analysis that it is not possible to achieve stability or that it takes many iterations to get to the stable solution.

The method used for solving the above nonlinear equations is an expanded version of the method described by Berman for a two-degree-of-freedom system (Reference 5). This method is generally applicable to sets of nonlinear differential equations with coefficients that are arbitrary functions of a single independent variable; in this case, the variable is time. A brief description of the procedures is outlined below.

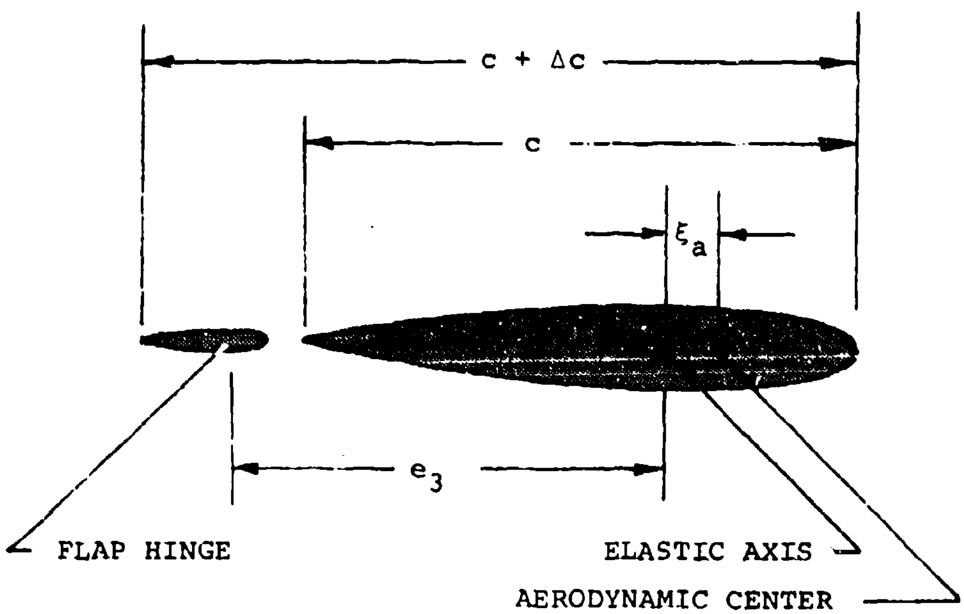


Figure 3. Blade and Flap Geometry.

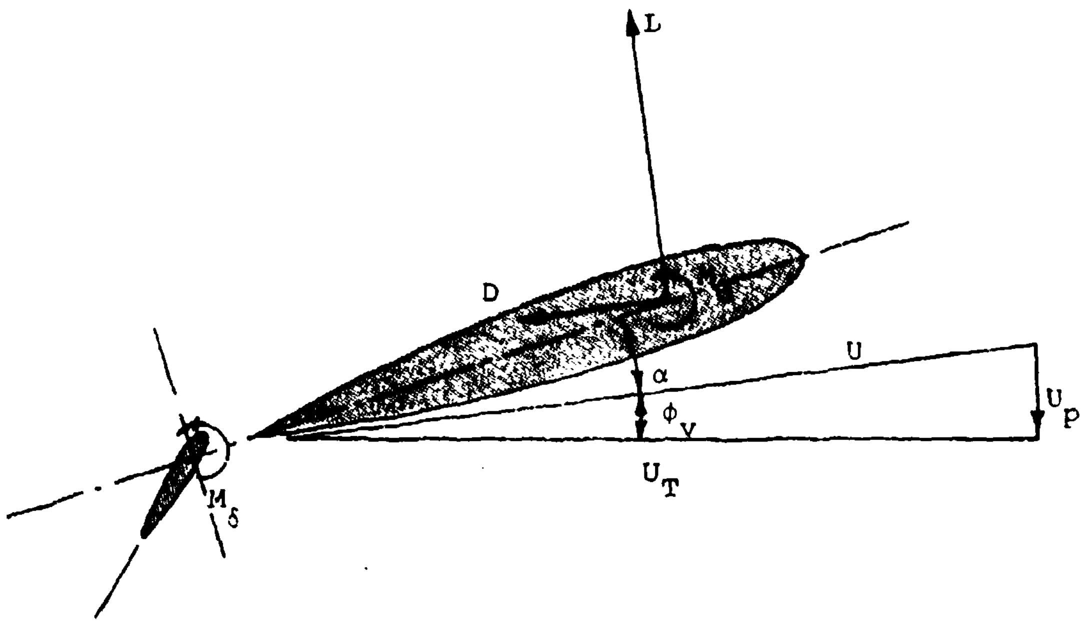


Figure 4. Airfoil Section Indicating Aerodynamic Force and Velocity Vectors.

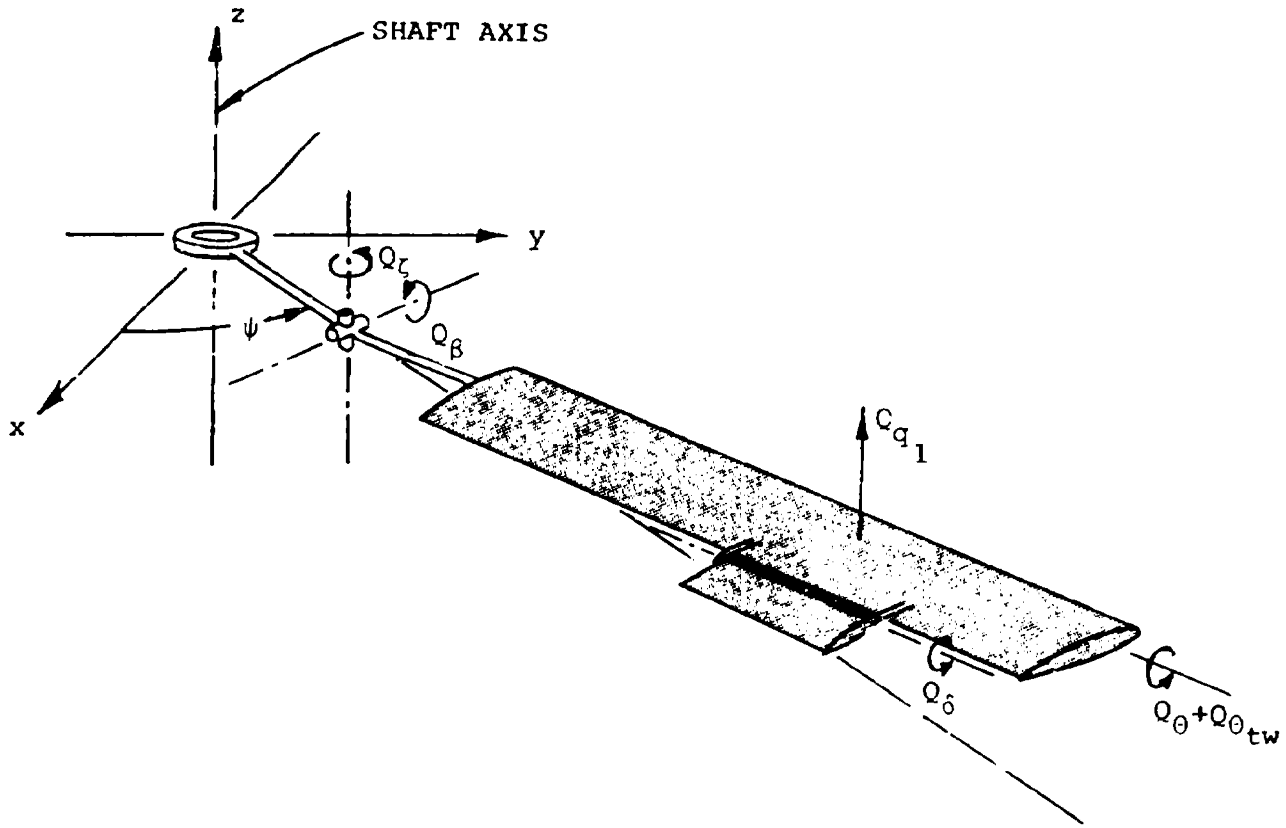


Figure 5. Generalized Forces of the Rotor System.

Initially, the set of nonlinear equations is linearized by making the usual small angle assumptions and neglecting terms higher than first order. The aerodynamic forcing functions are linearized only with respect to local angle of attack. Linearized aerodynamic force and moment derivatives are tabulated versus Mach number for the normal flow region, for the reverse-flow region, and for a narrow band around the reverse-flow circle corresponding to low dynamic pressures. The linearized differential equations are then written as a set of finite difference equations; they are summarized in Appendix II. The finite difference equations are solved via the integrating matrix operator developed by Berman.

The direct application of an integrating matrix operator to the linearized equations written in matrix form yields two important results. First, the completely coupled transient response of the linearized system to an initial disturbance is calculated. The initial disturbance can be a displacement or a velocity step input in any single mode or any combination of modes. Transient responses are calculated for a pre-specified time interval (usually 20 rotor revolutions) in order to evaluate the stability characteristics of the coupled system. Second, the response matrices of the system are obtained which depend only on the coefficients of the linearized equations. When the coefficients and the forcing functions are periodic, the response matrices are modified by the end conditions to yield periodic responses directly, without carrying the calculations through more than one cycle.

Thus, the initial value approach for obtaining linearized transient solutions is transformed into a boundary value approach for obtaining nonlinearized periodic (steady-state) solutions.

The response to the complete nonlinear equations is obtained through the use of the above-mentioned periodic response matrices. The methodology is better understood by beginning with the general description of the linear solutions. The left-hand side of the equation is composed of the linear inertia matrix $[I_L]$ and the linear airload matrix $[L_L]$, the sum of which is set equal to a forcing function matrix $[F]$. This leads to the following equation:

$$([I_L] + [L_L]) = [F] \tag{18}$$

The left-hand side of Equation (18) includes functions of the displacements, velocities, and accelerations of the various response modes. Through the techniques reported in Reference 4 and the integrating matrix operators of Reference 5, the left-hand side can be made functions of accelerations only such that Equation (18) can be rewritten in terms of the acceleration matrix $[\ddot{X}]$, as shown in Equation (19).

$$[A][\ddot{X}] = [F] \tag{19}$$

The periodic response matrix is defined by

$$[P] \equiv [A^{-1}] \tag{20}$$

where the matrices [A] and [P] are matrix operators. Equation (19) becomes

$$[\ddot{X}] = [P][F] \tag{21}$$

These matrices are integrated by the methods in Reference 5 to give velocities and displacements providing the linear solutions. These linear solutions are subsequently used as initial inputs for the iterative procedures in order to obtain nonlinear solutions.

The nonlinear equations can be similarly represented with nonlinear inertias $[I_{NL}]$, and nonlinear airloads $[L_{NL}]$, and set equal to the nonlinear forcing function $[F_{NL}]$ as in the following equation:

$$([I_{NL}] + [L_{NL}]) = [F_{NL}] \tag{22}$$

This equation can be rewritten

$$0 = [F_{NL}] - ([I_{NL}] + [L_{NL}]) \tag{23}$$

If the linear inertias and loads are added to both sides, we get Equation (24):

$$([I_L] + [L_L]) = ([I_L] + [L_L]) - ([I_{NL}] + [L_{NL}]) + [F_{NL}] \tag{24}$$

Using the definitions in Equations (18) through (21), we can write the accelerations as follows:

$$[\ddot{X}] = [P]\{([I_L] + [L_L]) - ([I_{NL}] + [L_{NL}]) + [F_{NL}]\} \quad (25)$$

Equation (25) represents a complete set of nonlinear equations operated on by linear response matrices. The included linear effects are self cancelling by definition from Equation (24). The numerical solutions of the acceleration matrix $[\ddot{X}]$ represent solutions for each response mode at every azimuth position.

Because the right-hand side of Equation (25) has terms which include modal velocities, displacements, and accelerations, it is solved by iterative methods. Subscripts are added to Equation (25) to indicate the successive iterations. The iterative nonlinear response equation is defined as

$$[\ddot{X}]_k = [P]\{([I_L] + [L_L])_{k-1} - ([I_{NL}] + [L_{NL}])_{k-1} + [F_{NL}]_{k-1}\} \quad (26)$$

where

k = present iteration count

$k-1$ = previous iteration count

and k has the range $(1 \leq k \leq N)$, with N being the number of iterations required for convergence.

The initial responses, i.e., displacements, velocities, and accelerations, are determined from the linear solution of Equation (21). These are substituted into the right-hand side of Equation (25) to generate the nonlinear matrices which are used to determine the second set of accelerations. In general, these new accelerations are not identical to those that were input on the right-hand side because the linear solution does not have the same accelerations as the nonlinear solutions. Therefore, these accelerations are integrated to obtain new displacements and velocities which are reinserted into the right-hand side to obtain a third solution to the accelerations. These substitutions are repeated until the kth responses coincide with the (k-1)th responses to within specified tolerances. The last set is the converged responses.

COMPUTER PROGRAM

A computer program for the aeroelastic analysis was written in FORTRAN IV language for an IBM 360/40 di··ital computer with a Disk Operating System, and a 132,00· ·ord storage capacity. (USAAMRDL will provide copies ci .he program upon receipt of a blank tape and a letter of request on organization letterhead stationary). The computer program can handle a rotor blade with 16 radial stations which are used to describe nonuniform radial distributions of chord, twist, airfoil section, mass, moment of inertia, chordwise center of gravity, bending mode, twisting mode, elastic axis, and aerodynamic center. Sixty azimuth positions can be evaluated for each of the six response modes. Aerodynamic force and moment coefficient data are tabulated for each of 3 airfoil sections at 5 Mach numbers and 49 angles of attack; one of the airfoil sections has coefficient data tabulated for 5 flap settings in addition to the Mach number and angle-of-attack ranges. Unsteady airfoil characteristics are estimated by force and moment derivatives based on Theodorsen theory.

Figure 6 illustrates schematically the basic program logic for computation of the rotor airloads and responses. Data for the specific rotor are input, and rotor inertias and linear aerodynamic terms are calculated. Pertinent information is stored on the disk for intermediate storage. The coefficients of the linearized equations are calculated and integrated to form the [A] matrix. This matrix is inverted to form the periodic response matrix which is stored on the disk for use in all subsequent solutions. The initial value matrix is determined, and the transient responses are obtained as a user option. The boundary conditions are generated and also stored on the disk.

The above portion of the computer program is known as Part I and must be run for every flight condition or for any change in the physical properties of the rotor. Part II of the computer program contains the input requirements for the controls (i.e., pitch horn and/or flap controls) and calculates the steady-state responses of the fully coupled nonlinear equations. Therefore, it must be run for each new control setting. Using the data stored on the disk and the input for the controls, the linear forcing functions are now calculated, and the linear steady-state responses are determined. The local angles of attack are computed from these linear responses, and the local airloads are determined from blade element theory. The nonlinear forcing functions are obtained using these airloads, and new blade responses are computed. The iterative process of computing nonlinear airloads and nonlinear responses is cycled until convergence is reached between successive iterations.

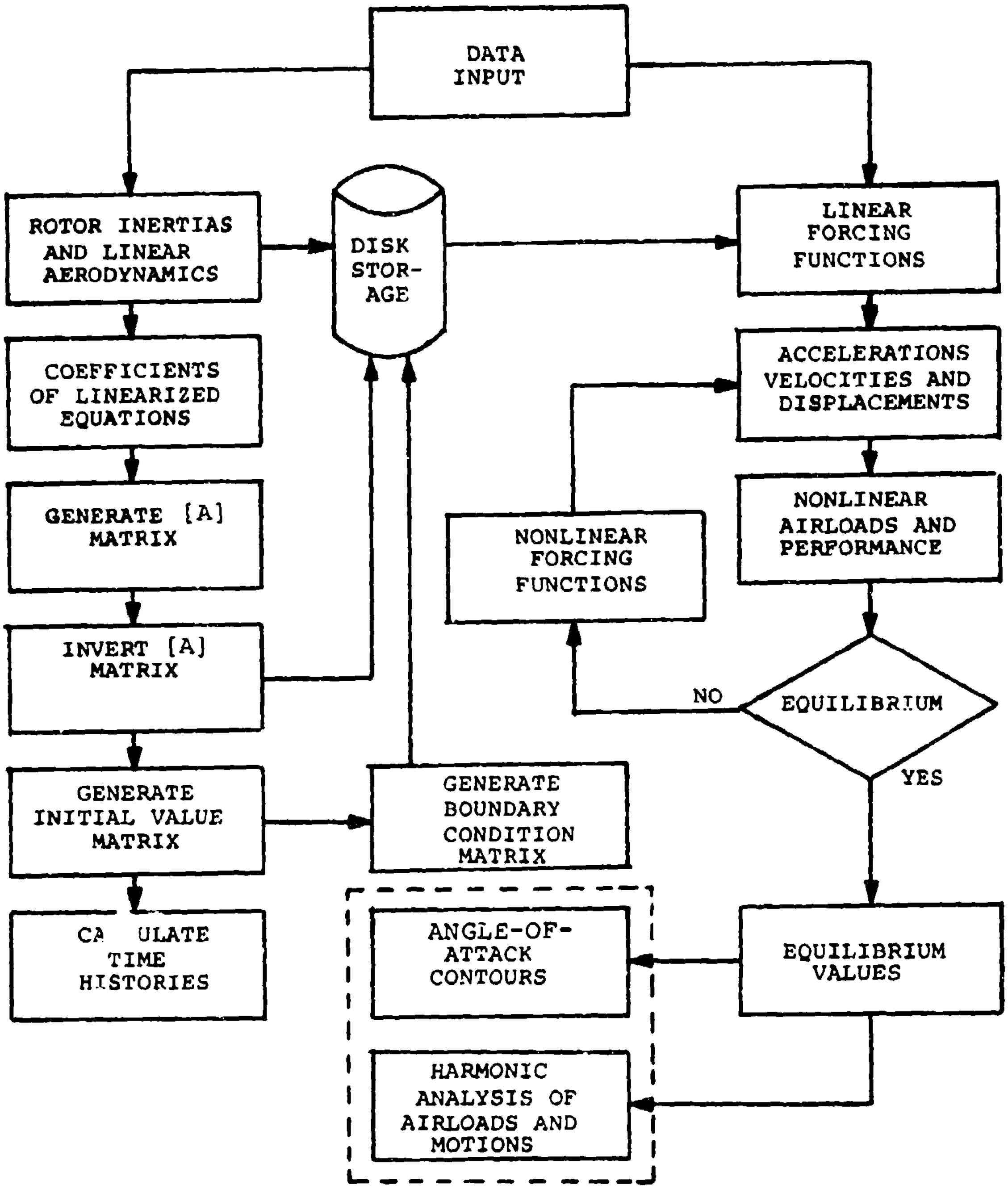


Figure 6. Flow Chart of the Computer Program for the Controllable Twist Rotor (CTR) Theoretical Analysis.

Rotor performance is calculated from the converged airloads by integrating the various airload distributions radially and azimuthally over the disk. The expressions used to evaluate rotor thrust, torque, drag, and side force are given below.

$$T_s = \frac{b}{2\pi}\int_{o}^{2\pi}\int_{e_1}^{R}(L\text{¢}_{\phi_v} - D\$_{\phi_v})\text{¢}_{\beta}\,drd\psi \tag{27}$$

$$Q_s = \frac{b}{2\pi}\int_{o}^{2\pi}\int_{e_1}^{R}(L\$_{\phi_v} + D\text{¢}_{\phi_v})\,rdrd\psi \tag{28}$$

$$H_s = \frac{b}{2\pi}\int_{o}^{2\pi}\int_{e_1}^{R}[(L\$_{\phi_v} + D\text{¢}_{\phi_v})\$_{\psi} - (L\text{¢}_{\phi_v} - D\$_{\phi_v})\$_{\beta}\text{¢}_{\psi}]\,drd\psi \tag{29}$$

$$Y_s = -\frac{b}{2\pi}\int_{o}^{2\pi}\int_{e_1}^{R}[(L\$_{\phi_v} + D\text{¢}_{\phi_v})\text{¢}_{\psi} + (L\text{¢}_{\phi_v} - D\$_{\phi_v})\$_{\beta}\$_{\psi}]\,drd\psi \tag{30}$$

Blade responses are printed in the form of radial and azimuthal distributions of angles of attack, airloads normal to the shaft plane, airloads in the shaft plane, feathering moments, torques, Mach numbers, and critical Mach number ratios. Time histories of the six coupled blade responses, pitch horn control loads, and flap rod control loads are also output. Standard harmonic analysis techniques automatically resolve the waveforms of angles of attack, airloads, moments, and blade responses to yield the harmonic content of each parameter. Angle-of-attack distributions are also interpolated automatically to locate radial stations corresponding to integer values in angle of attack. These latter results are used to generate angle-of-attack contour plots.

AERODYNAMIC FORCE AND MOMENT DATA

Unlike many pitch horn configurations which have a constant airfoil section over the length of the blade, the CTR has a section of the blade which contains a control flap. The presence of the flap and its concurrent deflections modify the pitching moments, the lift, and the drag of these blade sections. The present computer analysis has the capability of including at any radial stations a choice of aerodynamic data for any of three airfoil sections, one of which may include data for various flap deflections. The input for

the analysis requires the lift coefficient, drag coefficient, blade pitching moment coefficient, and flap hinge moment coefficient. The aforementioned section characteristics are based on the total chord of the blade and flap.

The aerodynamic characteristics for the airfoil sections used in this study are tabulated in Appendix IV. The section coefficients are presented for 49 angles of attack ranging from 0 to 360 degrees, for four Mach numbers, and for five flap deflections. Table XXXI contains the data for the modified Kaman 23012 airfoil. For the direct control rotor, these data are used over the whole rotor blade; for the CTR, they are used in the nonflapped regions only. The data for this airfoil were synthesized for the reverse-flow regions using data from Reference 9. Mach number effects were included by means of the Prandtl-Glauert correction factor as described in References 10 and 11.

The Kaman external flap has a NACA 63-015 airfoil section, and is placed directly aft of the Kaman modified 23012 blade section. The test data available for this combination are meager for high Mach numbers and large flap deflections. However, some wind tunnel data were available in Reference 11, which, when combined with extrapolations and the Prandtl-Glauert effects in Reference 10, were used to synthesize Table XXXII in Appendix IV.

The external trailing flap configuration described above carries some penalty in profile drag due to flap and blade interference and due to the gap between the flap and the blade. A faired flap modifies the airfoil section such that there is no gap; the flap combines with the blade to form a single airfoil section with a smooth surface running from the blade leading edge to the flap trailing edge. Data for the trailing flap mentioned above was modified in Reference 10 to account for the effects of fairing the surfaces; the resulting data for the faired flap airfoil are found in Table XXXIII in Appendix IV. The modifications include effects on lift coefficients, pitching moment coefficients, hinge moment coefficients, and profile drag coefficients.

ROTOR TRIM

The CTR aeroelastic loads analysis produces a set of forces, blade responses, and rotor performance for a specific set of control inputs. However, the forces produced are not necessarily the forces required for trim at the particular flight condition. The method for achieving the proper control inputs to obtain the necessary trim forces is called the trim program. Figure 7 is a flow chart that shows how the trim program is used. Several initial cases are run, producing a set of forces for each initial case. These forces are compared to the control inputs in the trim program, and a new control prediction is made based on these comparisons.

For a rotor system with a single control input (either pitch horn or aerodynamic flap), there is a unique combination of collective and cyclic control inputs which will generate the required trim hub forces at a specified speed. Because of its dual control inputs, the CTR has many combinations of collective and cyclic inputs that produce the same trim forces. Thus, trimming the CTR involves an optimization procedure. These rotor characteristics are illustrated in Figure 8.

In order to optimize the CTR dual controls, one of the controls is fixed during the trim process. An iteration process is begun whereby the pitch horn control settings remain fixed and the trim program compares the resultant rotor forces with those required for trim, and modifies the flap controls to achieve trim. The airloads program is run again, and the process is repeated until the output rotor forces match the required trim forces. Performance is determined only for trimmed cases such that no effort in this analysis is spent on untrimmed cases.

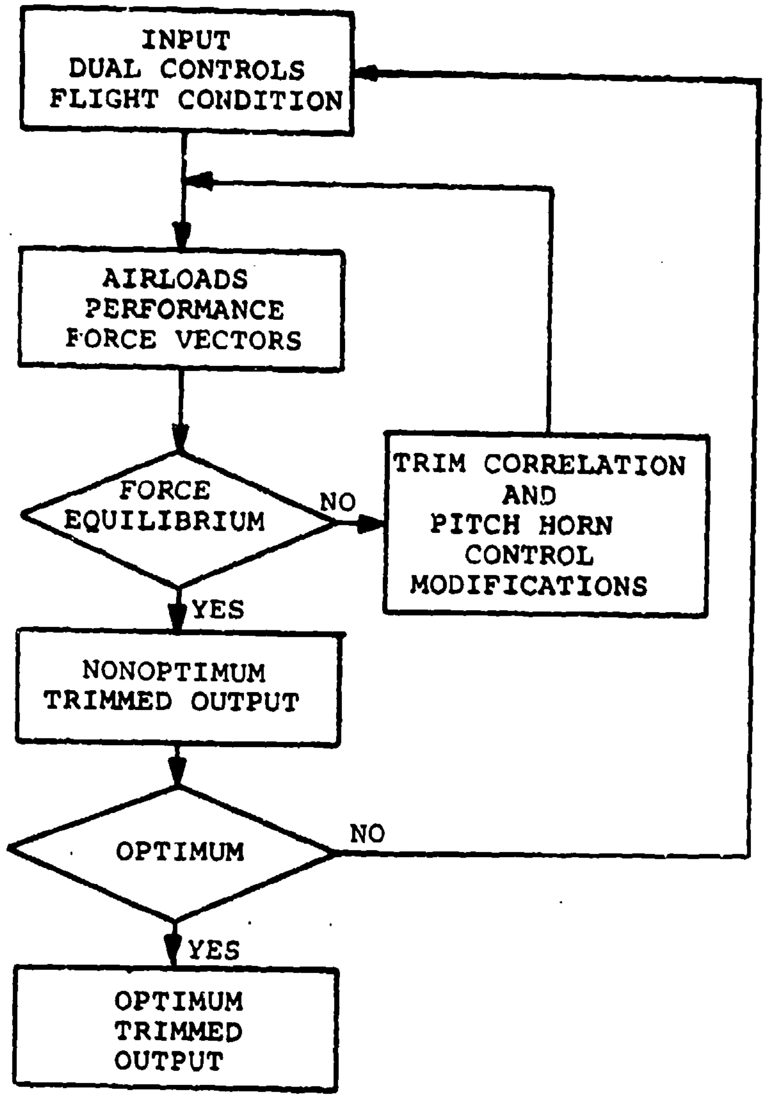


Figure 7. Flow Chart of Force Equilibrium Methods for the Controllable Twist Rotor Analysis.

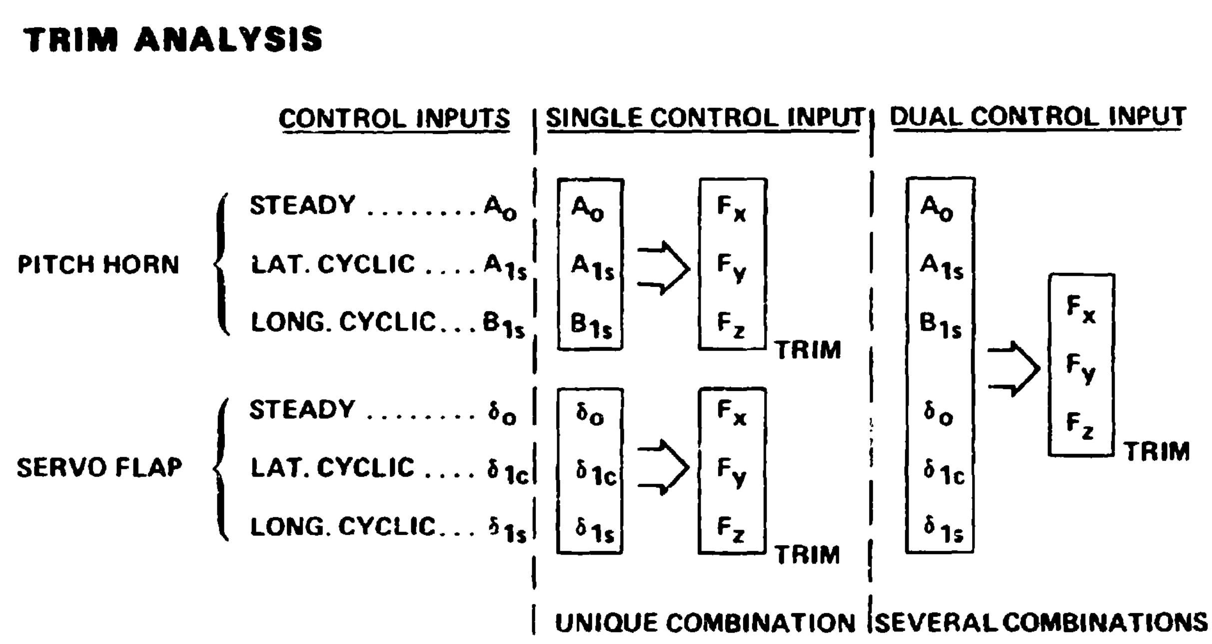


Figure 8. Control Input Combinations for Rotor Trim.

EVALUATION OF ROTOR CHARACTERISTICS

CONFIGURATION OPTIMIZATION

In order to provide a proper basis for comparing the controllable twist rotor with conventional rotors, an extensive parametric study was conducted of many CTR configurations. Four different CTR planforms were considered in combination with configuration changes to determine the effects of built-in twist, the aerodynamic effects of a faired flap as opposed to an external flap, the effects of flap size and location, the effects of blade torsional stiffness, and the effects of control input. A detailed description of the geometrical and inertial characteristics for each configuration is presented in Appendix III. Results of the parametric evaluation are also discussed in Appendix III and are used to select an optimum CTR configuration for further evaluative comparisons with a direct control rotor. The geometry of the optimized CTR as selected from the parametric study is presented in Table I.

In addition to the CTR configuration study, a parametric investigation was conducted with a conventional direct control rotor. One DCR blade planform was selected and was used to evaluate the effects of built-in twist and solidity. The geometrical and inertial properties for the DCR are described in Appendix III as are the results of the parametric study for this rotor system. Table I summarizes the characteristics of the final DCR system which will be used as a basis for comparison in the present study.

COMPARISON WITH CONVENTIONAL ROTORS

To quantitatively analyze the effects discussed previously and further benefits of the CTR as opposed to a comparable direct control rotor (DCR), over 5000 computer cases have been run for the optimized rotor systems described under the section titled "Analytical Methods" in this report. This includes over 400 trimmed cases.

Table I indicates that both the CTR blade and the DCR blade have the same general planform. The CTR was studied using four blades while the DCR was studied with four, five, and six blades. Otherwise, the rotors are comparable in appearance, having identical values of radius and blade chord. Both rotor systems were evaluated at identical tip speeds. A summary of significant computer runs is presented in Table II for the CTR and DCR systems.

TABLE I. RESULTING CONFIGURATION		
	Optimum CTR Configuration	DCR Configuration
Number of Blades	4	6
Radius	264 In. (44' Dia)	264 In. (44' Dia)
Hinge Offset	8.25 In.	8.25 In.
Chord	21.56 In.	21.56 In.
Built-In Twist	-2.0 Deg	-8.0 Deg
Torsional Frequency	2.00 Cycles/Rev	7.11 Cycles/Rev
Bending Frequency	3.10 Cycles/Rev	2.80 Cycles/Rev
Type Flap	Faired	-
Location of Flap ℄	89%R	-
Flap Span	58.3 In.	-
Flap Chord	8.3 In.	-
Solidity	.104 (no flap) .113 (with flap)	.156

TABLE II. TRIMMED COMPUTER CASES FOR THE CTR AND DCR

Rotor Type	Case No.	Adv Ratio μ	Vert. Force (lb) F_z	Hori. Force (lb) F_x	Lat Force (lb) F_y	Horse-power	Max Tip Angle of Attack (deg) α_{max}	Peak-to-Peak Tip Bend. (in.) q_M	Col Elas Twist (deg) ϕ_o	Cyc Elas Twist (deg) ϕ_r	Phase of Cyc Twist (deg) ψ_ϕ	Built-In Twist (deg) θ_x	Shaft Angle (deg) α_s	Inflow λ
CTR-4	760-AA	0.0	11493	63	17	1088	3.0	0.0	-5.4	0.0	-	-2.0	0.0	-.06
CTR-4	765-AQ	.3	11510	1200	28	1145	6.7	1.32	-5.0	1.9	45	-2.0	-9.5	-.062
CTR-4	765-AL	.4	11528	2718	-750	2222	12.5	2.83	-8.1	6.1	46	-2.0	-14.5	-.112
CTR-4	770-P3	.45	11491	2879	-1318	3340	13.0	3.32	-9.3	2.2	88	-2.0	-17.5	-.146
CTR-4	776-8	.3	21040	1201	27	1691	12.9	3.28	-10.3	6.6	178	-2.0	-9.5	-.071
CTR-4	777-20	.4	15508	2211	-748	2565	11.0	2.96	-7.2	4.1	207	-2.0	-14.5	-.115
DCR-6	554-A1	.3	11505	1201	29	1525	4.9	2.76	-1.2	.3	50	-8.0	-9.5	-.062
DCR-6	552-A1	.4	11475	2219	-741	2803	9.5	3.54	-1.1	.7	90	-8.0	-14.5	-.112
DCR-6	550-A3	.45	11436	2853	-1322	3928	13.1	3.76	-1.8	.9	-25	-8.0	-17.5	-.146
DCR-6	655-A3	.3	20990	1199	29	1918	9.6	3.44	-1.3	.1	58	-8.0	-9.4	-.071
DCR-6	571-A1	.4	15488	2207	-746	2938	11.3	4.03	-1.1	.5	88	-8.0	-14.5	-.115
DCR-5	654-1	.4	11487	2204	-745	2552	10.9	3.72	-1.1	.7	94	-8.0	-14.5	-.112
DCR-4	104-10	.4	11506	2215	-743	2364	13.7	4.13	-1.1	.6	-75	-8.0	-14.5	-.112
DCR-4	845-9	.45	11491	2910	-1311	4934	28.2	4.59	-2.5	1.1	-16	-8.0	-17.5	-.146

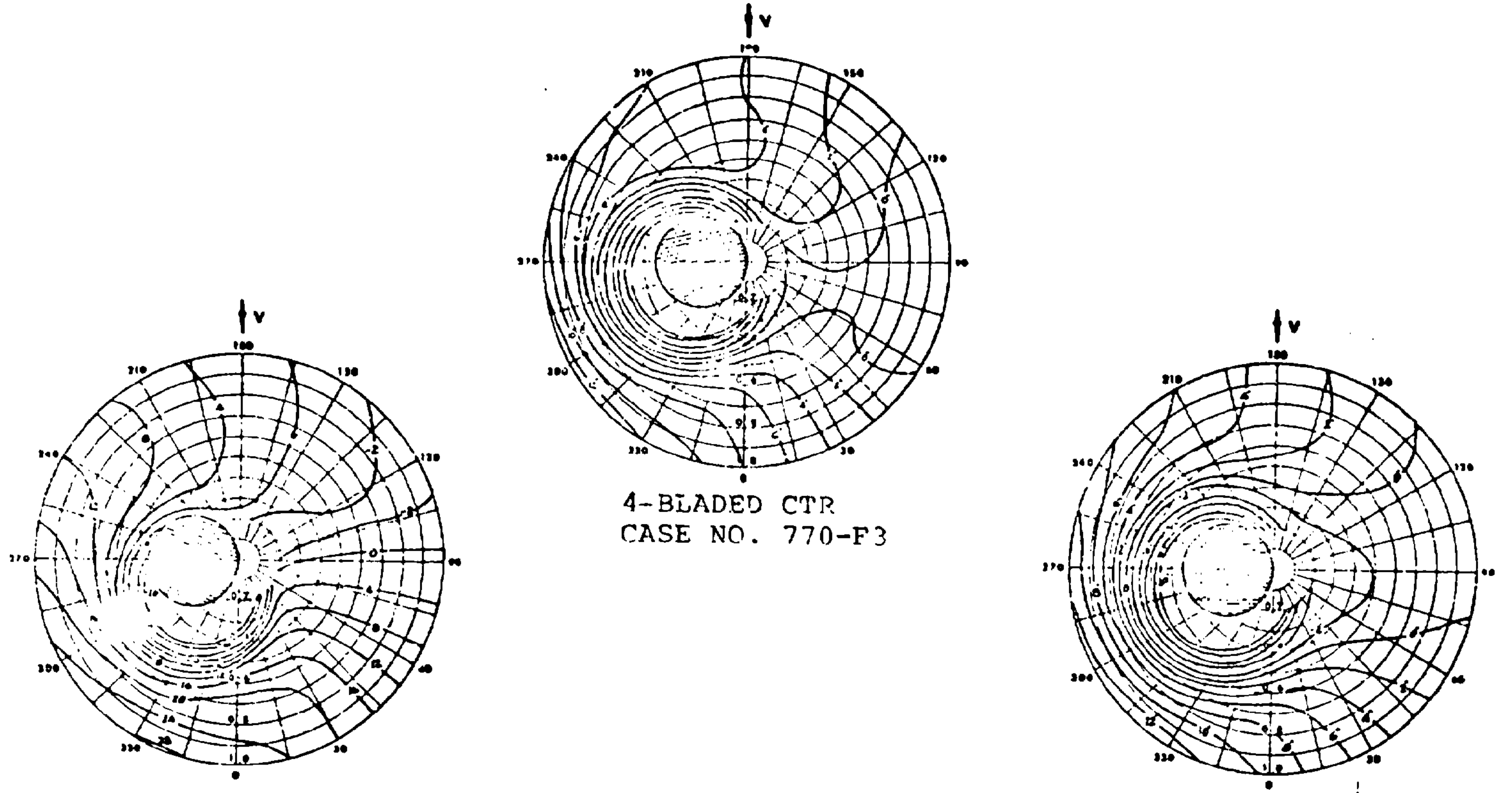
Figure 9 shows contour plots of angle-of-attack distribution for both the CTR and DCR four-bladed rotors at a design condition of 180 knots at standard sea level. This design condition corresponds to a maximum speed of 150 knots for a 4000-ft, 95°F day. As seen from Table II, both rotors were trimmed out to the same forces at this condition. Experience obtained at Kaman with the computer analysis indicates that flight conditions resulting in calculated local angles of attack greater than 13.5 degrees correspond to stall onset in flight. Therefore, this value has arbitrarily been established as the maximum allowable angle of attack on the rotor disk. In situations where the angle of attack exceeds 13.5 degrees, the rotor system is considered stalled.

Obviously in Figure 9, the four-bladed direct control rotor is deep into stall and cannot fly at this speed whereas the four-bladed CTR is not stalled. Thus, in order to design a direct control rotor to operate up to this speed, it is necessary to increase the solidity of such a system. The solidity was increased by considering both five- and six-bladed rotors. The contour plot of a six-bladed direct control rotor is shown in Figure 9. The six-bladed DCR is trimmed to the same forces as the four-bladed rotors. The higher solidity DCR now shows an improved angle-of-attack distribution.

Figure 10 shows the time histories of the section angles of attack at the blade tip and the 72-percent radius for both the four-bladed CTR and the six-bladed DCR at a flight speed of V = 180 knots. These curves indicate that both rotors are operating below stall. Figure 11 shows the out-of-plane airloads for these angles of attack at the 89-percent radius for the four-bladed CTR and the six-bladed DCR, operating at 180 knots. The four-bladed CTR has higher blade loadings than the six-bladed DCR because of different solidities.

Although these figures show that the four-bladed CTR and the six-bladed DCR have similar performance characteristics at the selected flight condition, this clearly does not constitute an adequate comparison. In comparing these rotor systems, the performance must be evaluated over the entire flight range as well as at the design condition.

To accomplish this broader comparison, much data has been generated using the computer facilities for the optimum CTR configuration and for the four-, five-, and six-bladed DCR configurations. These data contain results obtained over a range of flight speeds. The main rotor power required for both the CTR and DCR systems is depicted in Figure 12 as a function of flight speed.

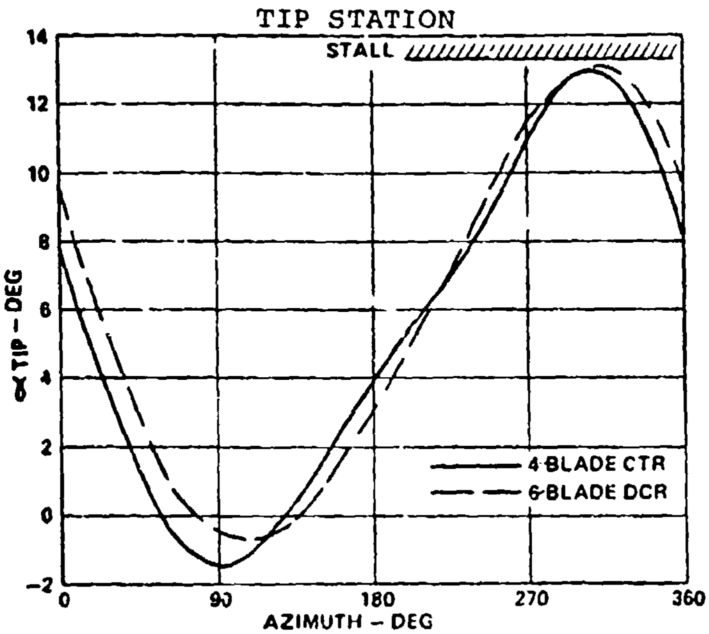


4-BLADED DCR
CASE NO. 845-9

4-BLADED CTR
CASE NO. 770-F3

6-BLADED DCR
CASE NO. 550-A3

Figure 9. Angle-of-Attack Contours for the CTR and DCR Systems. $V = 180$ Knots, $n_z = 1.00$.



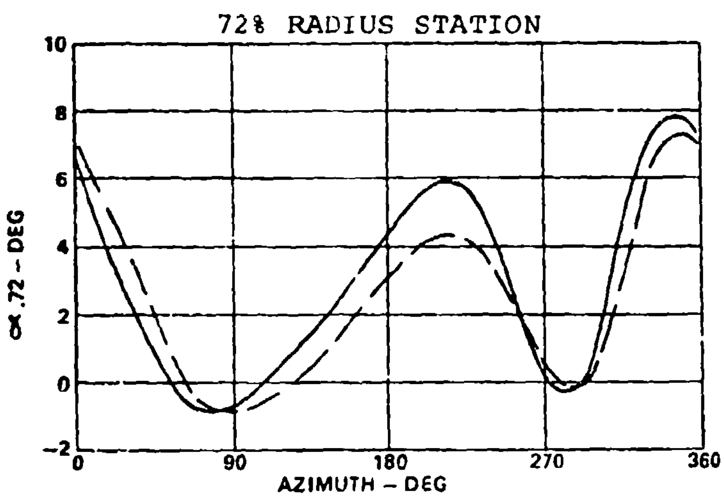
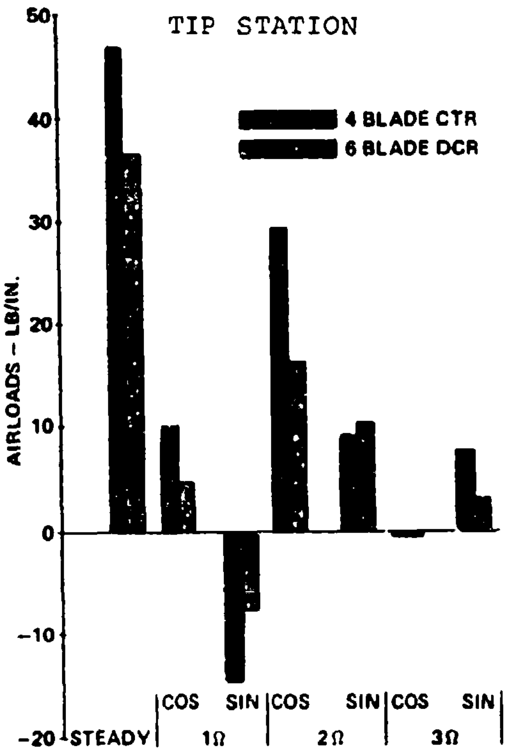


Figure 10. Section Angles of Attack at the Blade Tip and the 72% Radius for the 4-Bladed CTR and the 6-Bladed DCR; V = 180 Kts; n_z = 1.0 Case Numbers 770-F3 and 550-A3.



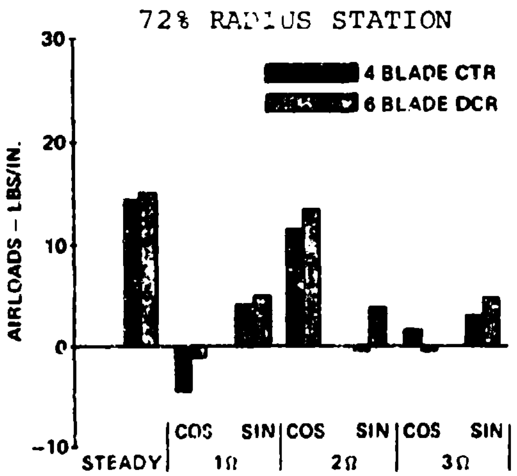


Figure 11. Out-of-Plane Airloads at the Blade Tip and the 72% Radius for the 4-Bladed CTR and the 6-Bladed DCR; V = 180 Kts; n_z = 1.0; Case Numbers 770-F3 and 550-A3.

f = 25 SQ FT

ρ/ρ_o = 1.0

GW = 11,500 LB

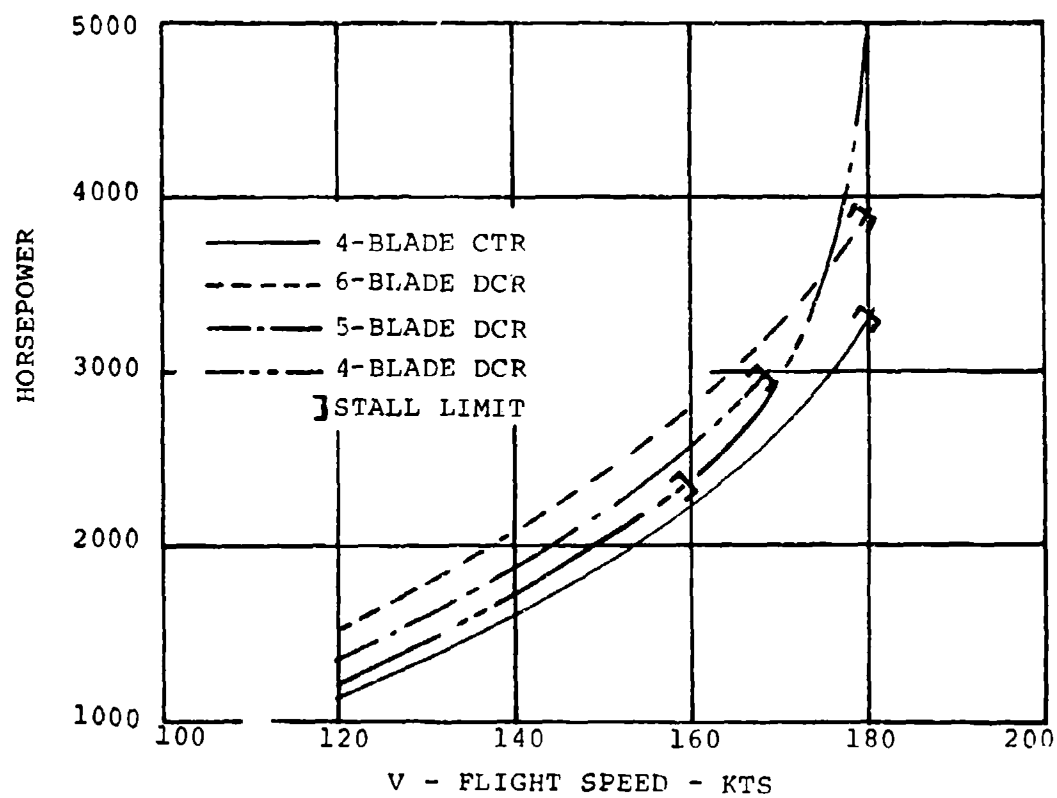


Figure 12. Main Rotor Power as a Function of Flight Speed for the CTR and DCR Systems.

As seen in Figure 12, there is an obvious reduction in the DCR power requirement due to reduced solidity in going from the six-bladed rotor to the four-bladed rotor. However, Figure 12 also shows that the four-bladed CTR requires less power than any of the DCR configurations. This reduced CTR power requirement indicates that the CTR not only makes use of lower solidity, it also has a more efficient twist schedule which results in less power than that of a geometrically similar DCR for the same flight conditions.

The maximum blade section angles of attack for the four rotor systems are plotted in Figure 13 as a function of forward speed. This plot indicates that the four-bladed DCR stalls at 159 knots, the five-bladed DCR stalls at 169 knots, and the six-bladed DCR stalls at 180 knots. The four-bladed CTR also stalls at 180 knots, a speed that is equivalent to that of the six-bladed DCR.

Over the flight speeds, shown in Figure 13, indicate that the CTR operates at lower angles of attack than the four-bladed DCR, whereas it operates at higher angles of attack than the five- or six-bladed DCR systems at the lower speeds. At the lower speeds, minimum angle of attack at the blade tip is not an objective for the CTR. Rather, the goal is to obtain more efficient blade loadings which result in lower rotor horsepower.

Horsepower and stall requirements are not the only important parameters in helicopter flight. Also of importance are vibration problems which result from elastic blade bending responses. It is conjectured that the magnitude of the elastic tip deflection is directly related to the magnitude of the blade vibratory forces which govern ship vibration levels and blade life. The elastic tip deflections due to flatwise bending are shown in Figure 14 for both the CTR and DCR systems and are plotted as a function of forward speed. As seen from this figure, the vibratory bending tip deflections for the four-bladed CTR are lower than those for the four-bladed, five-bladed, and six-bladed DCR over the complete flight spectrum. This comparison indicates further the benefits of a more uniform airload distribution.

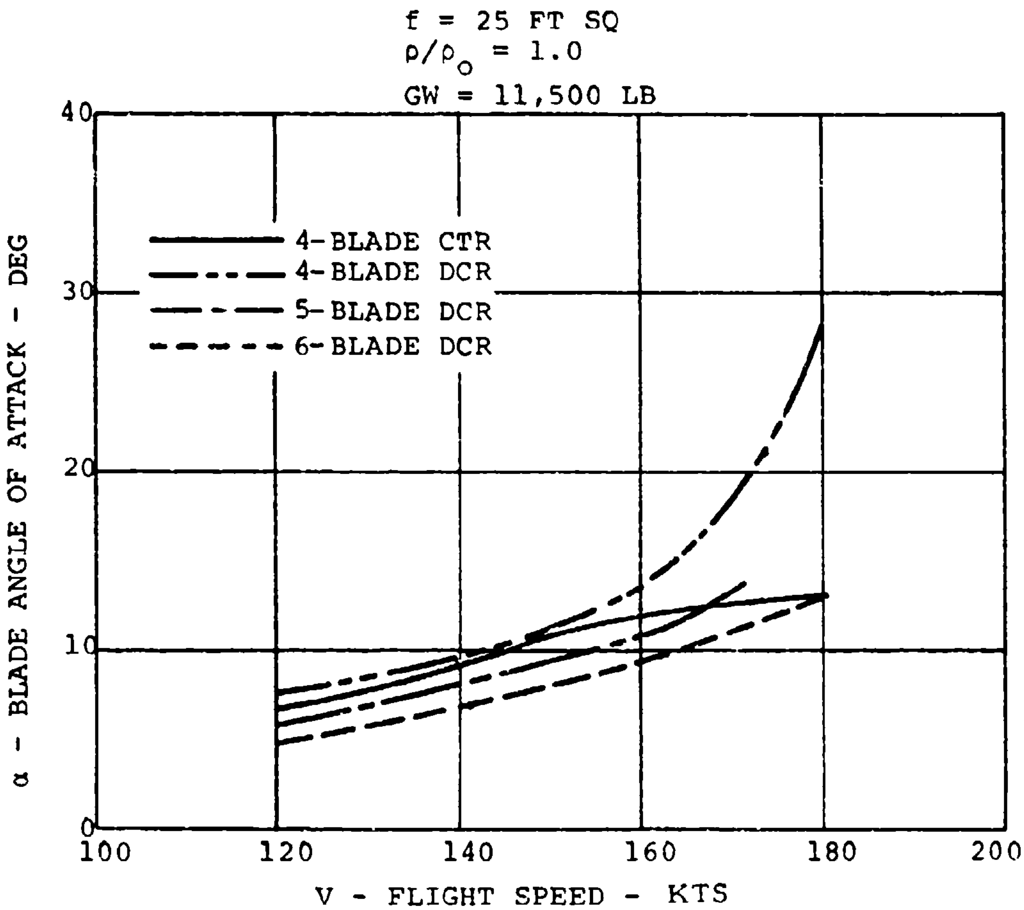


Figure 13. Maximum Blade Section Angle of Attack as a Function of Forward Speed for the CTR and DCR Systems.

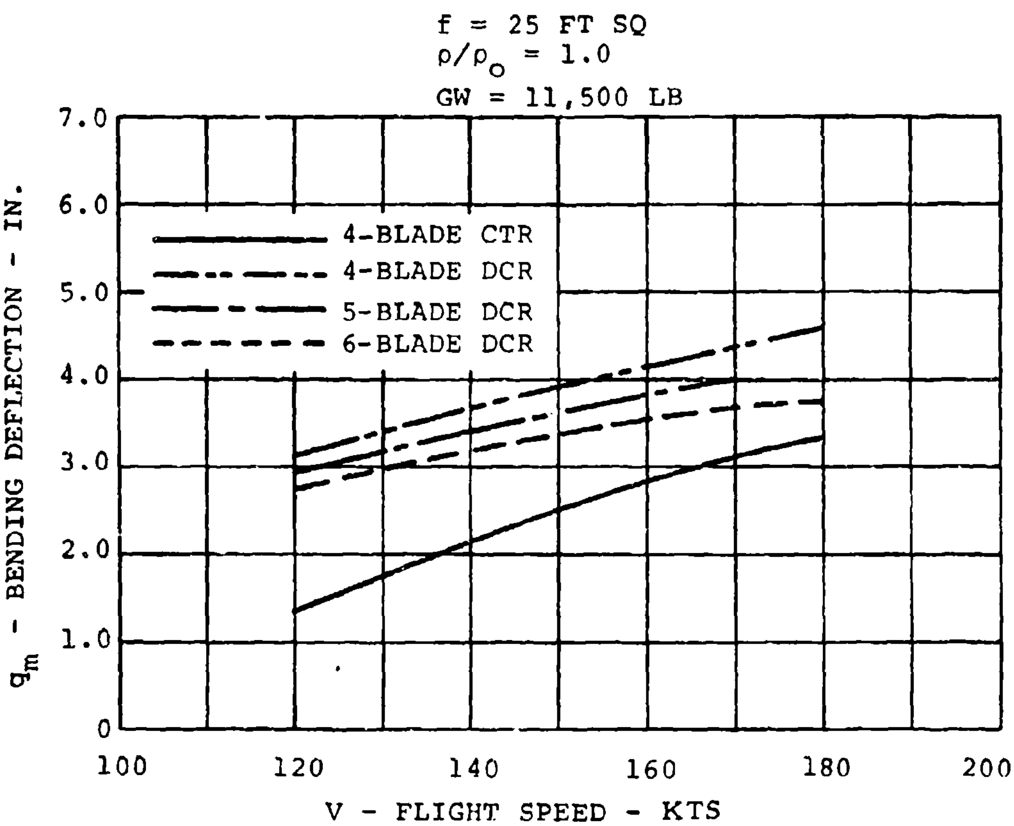


Figure 14. Elastic Flatwise Vibratory Tip Bending Deflection as a Function of Forward Speed for the CTR and DCR Systems.

The level flight conditions described above for a particular gross weight condition do not indicate the maximum thrust capability of the CTR and the DCR systems. For this study, maximum thrust at a specified forward speed is defined as the thrust generated by a rotor when it reaches a local angle of attack of 13.5 degrees at that speed. Computer runs were made specifically to evaluate this capability for both rotor systems. Results of a few maximum thrust cases are tabulated in Table II; many more cases are presented in Tables XII through XXX of Appendix III.

Few of the high thrust cases could be made to trim exactly at 13.5 degrees because of computer time limitations. Consequently, the calculated results from the high thrust cases were cross plotted and interpolated to generate maximum thrust boundaries which, in turn, were normalized on gross weight to define the load factor capability of each rotor.

Figure 15 presents load factor as a function of forward speed for the CTR and DCR configurations. The region between the load factor boundary and the level flight line ($n_z = 1.0$) represents the maneuverability margin for each rotor. As expected, the six-bladed DCR is capable of larger load factors than the five-bladed or the four-bladed DCR. The four-bladed CTR is equivalent to the six-bladed direct control rotor.

The CTR load factor is shown as a range of values within which the CTR can fly rather than as a unique boundary because the CTR can vary the maximum tip angle of attack through its elastic twist variations. The lower portion of this load factor range represents twist scheduling for minimum horsepower, whereas the upper portion represents twist scheduling for minimum tip angle of attack conditions.

The efficiency of the CTR is further demonstrated in Figure 16, where the maximum thrust-to-horsepower ratio is shown as a function of forward speed. In Figure 16, the load factor varies with forward speed and corresponds to the maximum attainable value for each point on these curves. The curves are intercepted by the stall boundary where the load factor is equal to 1.0. The CTR has a higher maximum thrust-to-horsepower ratio than the four-, five-, or six-bladed DCR over the speed range considered. Therefore, the CTR has sufficient thrust and horsepower reserve to handle any maneuver condition within the flight envelope, and surpasses conventional systems having 50 percent higher solidity.

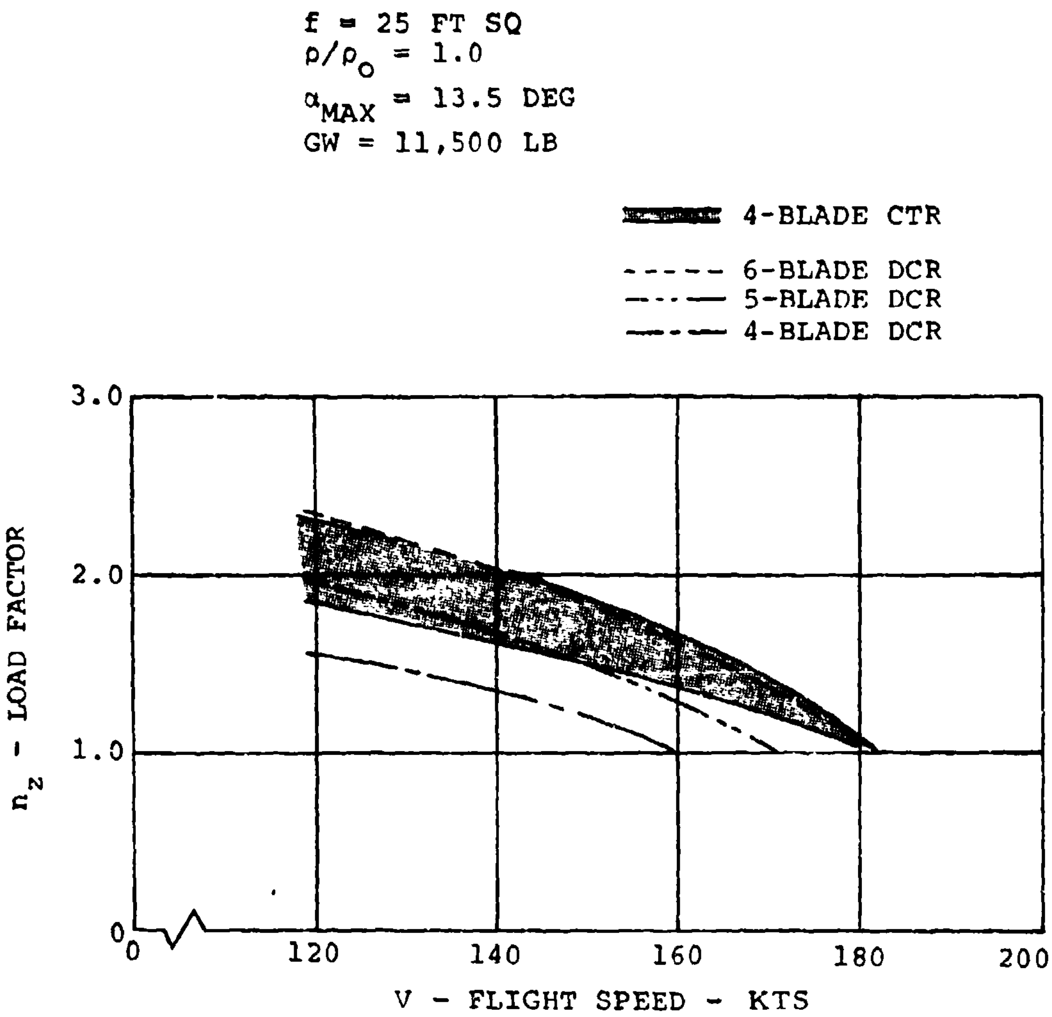


Figure 15. Load Factor as a Function of Forward Speed.

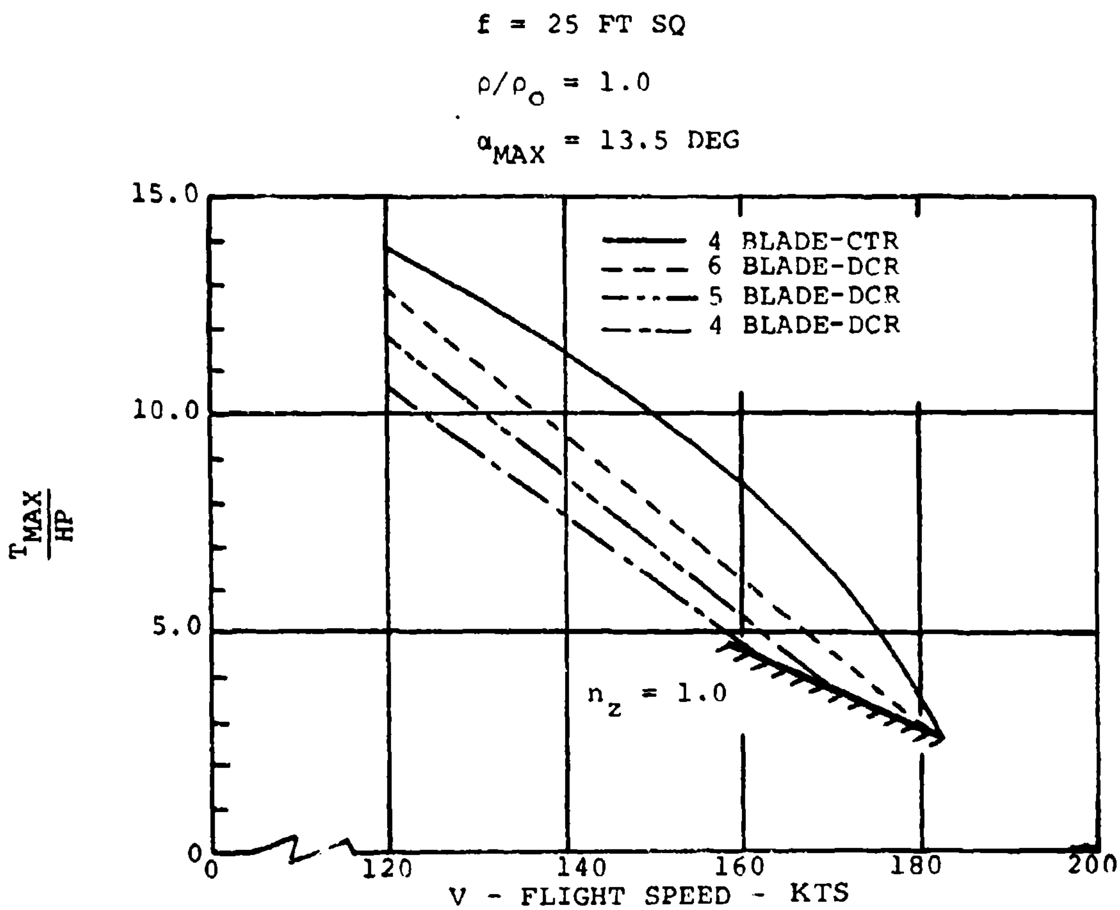
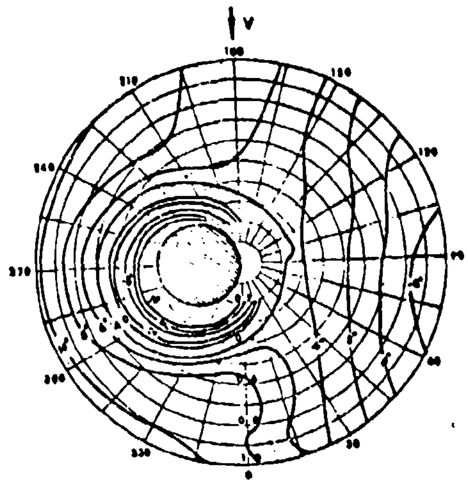
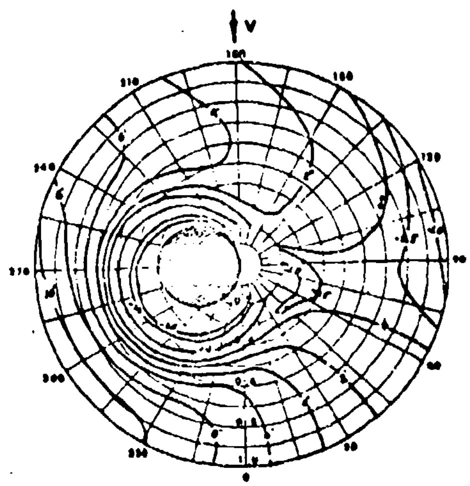


Figure 16. Maximum Thrust-to-Horsepower Ratio as a Function of Forward Speed.

Figures 17, 18, and 19 show how controllable twist can redistribute the angles of attack and airloads at the higher load factors. Figure 17 shows the angle-of-attack contours for the four-bladed CTR and the six-bladed DCR for a load factor of 1.35 operating at an airspeed of 160 knots. The CTR contour plot shows a substantial redistribution of angles of attack from that of the conventional rotor system while maintaining the same peak angles of attack; it has increased the average value of angle of attack over the advancing region of the rotor disk. Figure 18 shows the corresponding angle-of-attack time histories for the two rotors. These curves are plotted at the tip station and the 72-percent radial station. The CTR has increased angles of attack in the fore and aft azimuth positions and higher inboard angles of attack as compared to the conventional rotor system. This would be indicative of reduced loading on the advancing and retreating sides of the rotor, increased loading fore and aft, and increased loading over the inboard stations. Blade airload harmonics for the above flight conditions are depicted in Figure 19 in the form of bar charts. At the tip station and the 72-percent radial station, the 2-per-rev cosine airloading comparisons indicate that the CTR substantially increases the fore and aft airloading over the DCR. These redistributions improve the aerodynamic efficiency of the CTR system.



4-BLADED CTR
CASE NO. 777-20



6-BLADED DCR
CASE NO. 571-A1

Figure 17. Angle-of-Attack Contours for the 4-Bladed CTR and the 6-Bladed DCR; V = 160 Knots; n_z = 1.35.

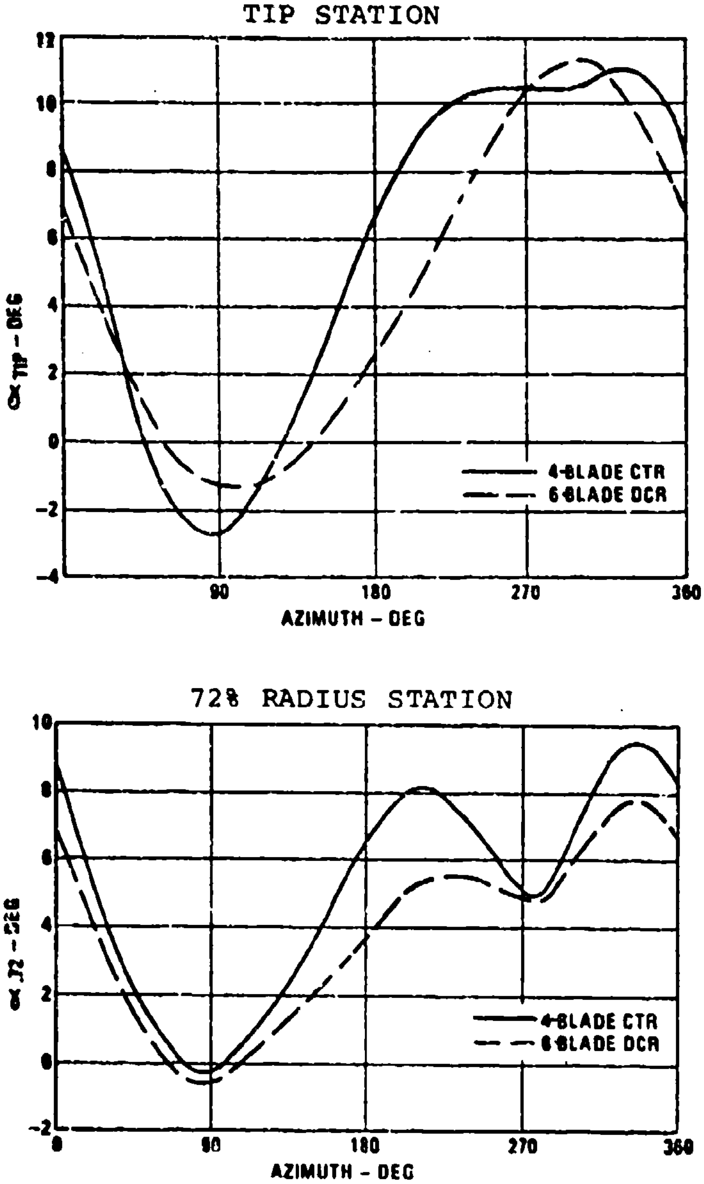


Figure 18. Section Angles of Attack at the Blade Tip and the 72% Radius for the 4-Bladed CTR and the 6-Bladed DCR; V = 160 Kts; n_z = 1.35; Case Numbers 777-20 and 571-A1.

TIP STATION

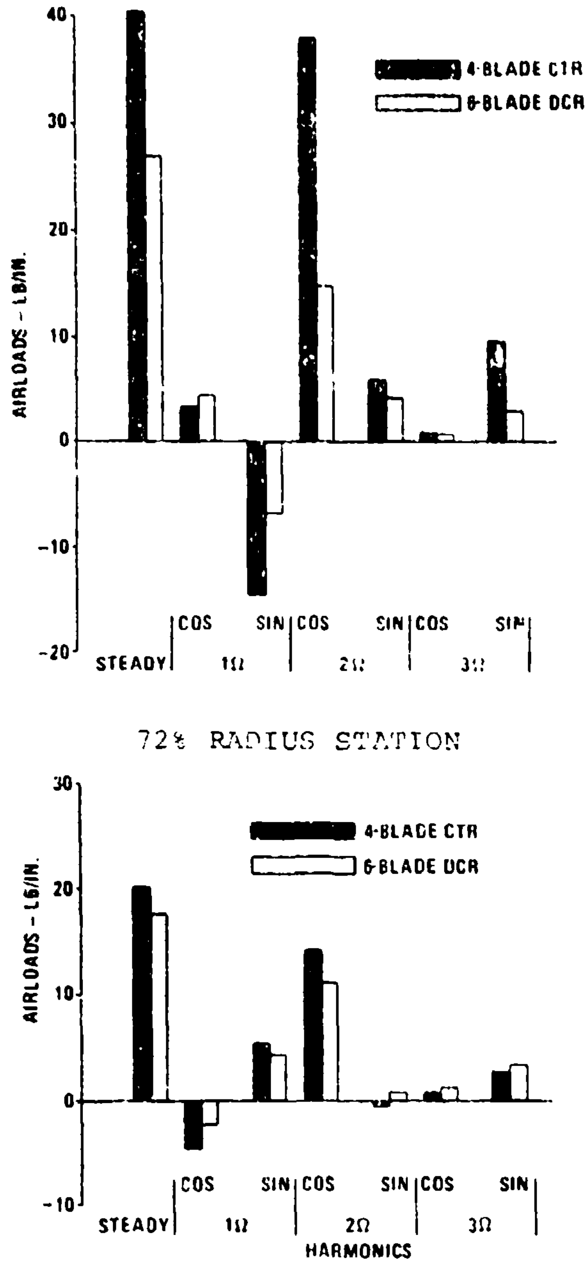


Figure 19. Out-of-Plane Airloads at the Blade Tip and the 72% Radius for the 4-Bladed CTR and the 6-Bladed DCR; V = 160 Kts; n_z = 1.35; Case Numbers 777-20 and 571-A1.

MISSION ANALYSIS

Up to this point, comparisons between CTR and DCR were made for a 11,500-pound utility helicopter with the flat plate drag area of 25 square feet. The comparisons show that in order to match CTR one g capability, the DCR requires a 50 percent increase in solidity at the limit design speed of 180 knots. This increased rotor solidity will increase significantly the DCR vehicle empty weight and installed power which, in turn, either will deteriorate the useful load at a fixed gross weight or will increase the vehicle gross weight to accommodate the same load. As was illustrated in Figure 12, the DCR requires 15 to 25 percent greater power than the CTR over all forward speeds for the same gross weight. Consequently, the range for a helicopter using a CTR will be 18 percent greater than that for the vehicle with reduced load using a DCR. As was shown in Figure 14, the DCR blade tip bending amplitudes are 40 percent higher than those of the CTR configuration at the cruise speed conditions of 120 to 140 knots. The increased bending will significantly decrease DCR blade life and increase ship vibration levels. This, in turn, will require greater weights for the various components subjected to these vibration levels.

A more valid comparison between the two rotor systems can be made by sizing the vehicle and rotor to hover OGE at 4000 ft, 95°F and to fly a 1000-pound load over a range of 200 nautical miles at a cruise speed of 140 knots at 4000 ft, 95°F. This latter mission requirement translates into a maximum airspeed of 175 knots (10 knots below stall) at standard sea level. Using trending data and a statistical weight breakdown, the performance parameters shown in Table III were developed for both CTR and DCR propelled helicopters. As seen in Table III, the direct control rotor helicopter has a 19-percent increase in takeoff gross weight to accomplish the specified mission. In order to accomplish this, the DCR vehicle requires 37 percent increase in fuel load and 30 percent higher installed power. The direct control rotor diameter is 10 percent greater than that of the CTR in order to maintain the same disk loading. These performance benefits accrue because CTR can carry a 50-percent higher blade loading than its DCR counterpart without stalling.

TABLE III. ESTIMATED PERFORMANCE PARAMETERS AND WEIGHT BREAKDOWNS FOR THE MISSION ANALYSES COMPARING THE 4-BLADED CTR TO A 6-BLADED DCR

Aircraft Performance Parameters

	DCR	CTR
Rotor Diameter (ft)	48	44
Solidity (σ)	.156	.104
Drag Area (ft^2)	28.3	25
Installed Power (Mil SL 59°F Rating) (HP)	4520	3500
Disk Loading (lb/ft^2)	7.56	7.56
Blade Loading (lb/ft^2)	48.5	72.8
Main Rotor Tip Speed, ΩR (fps)	661	661
Hover Power Requirements (OGE, 4000 ft, 95°F)	2000	1700
Hover Power Available (4000 ft, 95°F)	3200	2500

Statistical Weight Breakdown

	DCR	CTR
Structures, Rotor, Transmission	6120	5360*
Equipment	850	790
Twinned Powerplants & Installation	2050	1680
Fuel	3380	2460
Fuel System	300	210
Mission Load	1000	1000
Takeoff Gross Weight	13700	11500

*Includes CTR Weight Penalties; 80 lb for Flaps and Mass Balance; 170 lb for Duplicate Control.

CONCLUSIONS

The following conclusions are made as a result of the mission analysis comparing the controllable twist rotor (CTR) to a conventional direct control rotor (DCR) that is sized to perform the stated mission:

1. The CTR requires a 30-percent decrease in solidity to match the DCR 1.0 g capability.

2. The CTR requires 15 percent less power than the DCR over all forward speeds.

3. The CTR propelled helicopter has an 18 percent greater range than that of a DCR propelled helicopter.

4. Blade bending amplitudes on the CTR are 30 percent lower than the blade bending amplitudes on the DCR at cruise speeds.

5. The lower CTR blade bending amplitudes result in significantly increased blade life and reduced ship vibration levels.

6. The CTR helicopter gross weight is 15 percent lighter than the DCR helicopter gross weight.

7. The CTR diameter is 10 percent less than the DCR diameter.

8. Installed power on the CTR helicopter is 25 percent less than installed power on the DCR helicopter.

9. CTR hover power requirements (OGE, 4000 ft, 95°F) are 15 percent less than those of the DCR.

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APPENDIX I
MATRIX TRANSFORMATIONS

The following is a list of matrix transformations used in Equations (4) and (5).

$$\Xi_1 = \begin{pmatrix} 0 \\ \xi_1 \\ 0 \end{pmatrix} \quad \Xi_2 = \begin{pmatrix} 0 \\ \xi_2 \\ 0 \end{pmatrix} \quad E_1 = \begin{pmatrix} e_1 \\ 0 \\ 0 \end{pmatrix}$$

$$E_2 = \begin{pmatrix} e_2 - e_1 \\ 0 \\ 0 \end{pmatrix} \quad E_3 = \begin{pmatrix} 0 \\ e_3 \\ 0 \end{pmatrix} \quad V = \begin{pmatrix} -V_x \\ V_y \\ V_z \end{pmatrix}$$

$$Q = \begin{pmatrix} -\Delta_p \\ 0 \\ q_1 \phi_c \end{pmatrix} \qquad P = \begin{pmatrix} r - e_2 \\ 0 \\ 0 \end{pmatrix}$$

$$\Theta = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \text{¢}_\theta & -\$_\theta \\ 0 & \$_\theta & \text{¢}_\theta \end{pmatrix} \qquad \Theta_x = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \text{¢}_{\theta_x} & -\$_{\theta_x} \\ 0 & \$_{\theta_x} & \text{¢}_{\theta_x} \end{pmatrix}$$

$$\Phi_{tw} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \text{¢}_{(\phi_{tw}\ \theta_{tw})} & -\$_{(\phi_{tw}\ \theta_{tw})} \\ 0 & \$_{(\phi_{tw}\ \theta_{tw})} & \text{¢}_{(\phi_{tw}\ \theta_{tw})} \end{pmatrix} \quad \Delta = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \text{¢}_{\delta} & -\$_{\delta} \\ 0 & \$_{\delta} & \text{¢}_{\delta} \end{pmatrix}$$

$$Z = \begin{pmatrix} \text{¢}_{\zeta} & -\$_{\zeta} & 0 \\ \$_{\zeta} & \text{¢}_{\zeta} & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad \Psi = \begin{pmatrix} \text{¢}_{\psi} & -\$_{\psi} & 0 \\ \$_{\psi} & \text{¢}_{\psi} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

where ¢_u = cosine u

$\$_u$ = sine u

NONLINEAR RESPONSE EQUATIONS

Flapping

$$
\begin{aligned}
\int \frac{\partial \chi^t}{\partial \beta}\,\ddot{\chi}\,dm = &\{e_1[\Gamma_1 \$_\beta - (\Gamma_{22} + \Gamma_{25})\,\text{¢}_\beta]\,\text{¢}_\zeta\}\,\Omega^2 + \{(e_2 - e_1)\ [\Gamma_1 \$_\beta \\
&- (\Gamma_{22} + \Gamma_{25})\,\text{¢}_\beta] + [\Gamma_4 - \Gamma_{50} - 2\Gamma_{54} - \Gamma_{58}]\,\$_\beta \text{¢}_\beta + [\Gamma_{42} + \Gamma_{45} \\
&- \frac{q_1^2}{2}(\Gamma_{46} + \Gamma_{49})]\ (\$_\beta^2 - \text{¢}_\beta^2)\}\ (\Omega + \dot{\zeta})^2 + 2\{[\Gamma_{42} + \Gamma_{45} \\
&- \frac{q_1^2}{2}(\Gamma_{46} + \Gamma_{49})]\ \$_\beta - [\Gamma_{50} + 2\Gamma_{54} + \Gamma_{58}]\ \text{¢}_\beta\}(\Omega + \dot{\zeta})\dot{\theta} \\
&+2\ \{\Gamma_6 \$_\beta - [(\Gamma_{34} + \Gamma_{40})\text{¢}_{(\theta+\delta)} + (\Gamma_{35} + \Gamma_{41})\$_{(\theta+\delta)}]\ \text{¢}_\beta\}\ (\Omega \\
&+\dot{\zeta})\ \dot{\delta} + 2\ \{ -(\Gamma_9 - \frac{q_1^2}{2}\Gamma_8)\ \$_\beta + [(\Gamma_{26} + \Gamma_{30})\ \text{¢}_\theta + (\Gamma_{27} \\
&+ \Gamma_{31})\ \$_\theta]\ \text{¢}_\beta\}(\Omega + \dot{\zeta})\ \dot{q}_1 + 2\{\Gamma_{51} - \Gamma_{53} + \Gamma_{55} - \Gamma_{57}\}\dot{\beta}\dot{\theta} \\
&+2\{(\Gamma_{35} + \Gamma_{41})\text{¢}_{(\theta+\delta)} - (\Gamma_{34} + \Gamma_{40})\$_{(\theta+\delta)}\}\dot{\beta}\dot{\delta} + 2\{-q_1\Gamma_{21} \\
&- (\Gamma_{27} + \Gamma_{31})\ \text{¢}_\theta + (\Gamma_{26} + \Gamma_{30})\ \$_\theta\}\dot{\beta}\dot{q}_1 + \{\Gamma_{42} + \Gamma_{45} \\
&+ \frac{q_1^2}{2}\ (\Gamma_{46} - \Gamma_{49})\}\dot{\theta}^2 + 2\{\Gamma_6\}\ (\theta + \dot{\delta})\ \dot{\delta} + 2\ \{-\Gamma_9 \\
&- \frac{q_1^2}{2}\ \Gamma_8\}\ \dot{\theta}\dot{q}_1 + \{-\Gamma_{18} + q_1\,\Gamma_7 + \Gamma_{13}\}\dot{q}_1^2 + \{[\Gamma_{44} - \Gamma_{43} \\
&- \frac{q_1^2}{2}\ (\Gamma_{48} - \Gamma_{47})]\ \$_\beta + [\Gamma_{51} - \Gamma_{53} + \Gamma_{55} - \Gamma_{57}]\ \text{¢}_\beta\}\zeta \\
&+ \{\Gamma_4 + \Gamma_{50} + 2\Gamma_{54} + \Gamma_{58}\}\ \ddot{\beta} + \{\ \Gamma_{43} - \Gamma_{44} - \frac{q_1^2}{2}\ (\Gamma_{48} \\
&- \Gamma_{47})\}\ \ddot{\theta} + \{-\Gamma_5\}\ddot{\delta} + \{\Gamma_{10} - \frac{q_1^2}{2}\ \Gamma_7 - q_1(\Gamma_{46} + \Gamma_{49})\}\ddot{q}_1 \\
&+ \{e_3 S_{43} - I_5 - I_{26}\}\ \ddot{\theta}_{tw} + \{-2(e_3^2 M_{27} + I_{12} - 2e_3 S_{47} \\
&+ I_{35}\}\dot{\theta}_{tw} + \{e_3 S_{43} - I_5 - I_{26} + e_2(e_3 M_{26} - S_{14})\}\}\,\theta_{tw} \quad (31)
\end{aligned}
$$

First Flapwise Bending

$$
\begin{aligned}
\int \frac{\partial \chi^t}{\partial q_1}\, \ddot{\chi}\, dm = & \{-e_1\Gamma_{16}\$_\zeta + e_1[q_1(S_{10} + S_{36})\not{c}_\beta + \Gamma_{15}\$_\beta]\, \not{c}_\zeta\}\, \Omega^2 \\
& + \{(e_2 - e_1)\, [q_1(S_{10} + S_{36})\, \not{c}_\beta + \Gamma_{15}\, \$_\beta] + q_1\Gamma_{21}\not{c}_\beta^{\,2} \\
& + (\Gamma_{10} - \frac{q_1^2}{2}\, \Gamma_7)\, \$_\beta\not{c}_\beta + [(\Gamma_{27} + \Gamma_{31})\, \not{c}_\theta - (\Gamma_{26} + \Gamma_{30})\$_\theta]\$_\beta^{\,2} \\
& + q_1(\Gamma_{46} + \Gamma_{49})\, \$_\beta\not{c}_\beta - (\Gamma_{28} - \Gamma_{30})\, \$_\theta - (\Gamma_{27} - \Gamma_{29})\, \not{c}_\theta\}(\Omega \\
& + \dot{\zeta})^2 + 2\{(\Gamma_9 - \frac{q_1^2}{2}\Gamma_8)\, \$_\beta - [(\Gamma_{26} + \Gamma_{30})\, \not{c}_\theta + (\Gamma_{27} \\
& + \Gamma_{31})\, \$_\theta]\, \not{c}_\beta\}(\Omega + \dot{\zeta})\, \dot{\beta} + 2\{-\Gamma_{20}\$_\beta + q_1(\Gamma_{46} + \Gamma_{49})\, \not{c}_\beta\}(\Omega \\
& + \dot{\zeta})\, \dot{\theta} + 2\{q_1\Gamma_{13}\not{c}_\beta + I_{36}\$_\delta\$_\beta\}(\Omega + \dot{\zeta})\, \dot{\delta} + \{q_1\Gamma_{21} + (\Gamma_{27} \\
& + \Gamma_{31})\, \not{c}_\theta - (\Gamma_{26} + \Gamma_{30})\, \$_\theta\}\, \dot{\beta}^2 + 2\{-q_1(\Gamma_{47} - \Gamma_{48})\}\, \dot{\beta}\dot{\theta} \\
& + 2\{q_1\Gamma_{14}\}\, \dot{\beta}\dot{\delta} + \{-\Gamma_{20}\}\, \dot{\theta}^2 + \{S_{30}\$_\delta\}(2\dot{\theta} + \dot{\delta})\dot{\delta} + \{q_1(I_{21} \\
& + S_{39})\}\, \dot{q}_1^2 + \{-\Gamma_{17}\}\, \ddot{\theta} + \{-S_{30}\not{c}_\delta\}\ddot{\delta} + \{-(e_2 - e_1)\, \Gamma_{16} \\
& - [\Gamma_9 - \frac{q_1^2}{2}\Gamma_8 - q_1(\Gamma_{47} - \Gamma_{48})]\, \not{c}_\beta - \Gamma_{17}\, \$_\beta\}\ddot{\zeta} + \{\Gamma_{10} \\
& - \frac{q_1^2}{2}\Gamma_7 - q_1(\Gamma_{46} + \Gamma_{49})\}\, \ddot{\beta} + \{(M_4 + M_{20}) + q_1^2\, (I_{21} \\
& + S_{39})\}\, \ddot{q}_1 + \{e_3M_{34} - S_{15} - S_{54}\}\, \ddot{\theta}_{tw} + \{e_3M_{37} - S_{18} \\
& + S_{55} - S_{57} - e_3M_{35} + S_{16}\}\, \theta_{tw} \qquad (32)
\end{aligned}
$$

Feathering

$$
\begin{aligned}
\int \frac{\partial \chi^t}{\partial \theta} \ddot{\chi}\, dm &- \{e_1[(\Gamma_{22} + \Gamma_{25})\ \$_\zeta - (\Gamma_{23} - \Gamma_{24})\ \text{¢}_\zeta \$_\beta]\}\ \Omega^2 \\
&+ \{-(e_2 - e_1)(\Gamma_{23} - \Gamma_{24})\ \$_\beta - [\Gamma_{43} - \Gamma_{44} + \frac{q_1^2}{2} (\Gamma_{48} \\
&- \Gamma_{47})]\ \$_\beta \text{¢}_\beta + [\Gamma_{51} - \Gamma_{53} + \Gamma_{55} - \Gamma_{57}]\ \text{¢}_\beta^{\,2}\}(\Omega + \dot{\zeta})^2 \\
&+ 2\{[\Gamma_{50} + 2\Gamma_{54} + \Gamma_{58}]\ \text{¢}_\beta - [\Gamma_{42} + \Gamma_{45} - \frac{q_1^2}{2} (\Gamma_{46} \\
&+ \Gamma_{49})\ \$_\beta\}(\Omega + \dot{\zeta})\ \dot{\beta} + 2\{-\Gamma_2 \$_\beta\}(\Omega + \dot{\zeta})\ \dot{\delta} + 2\{-\ q_1[\Gamma_{46} \\
&+ \Gamma_{49}]\ \text{¢}_\beta + \Gamma_{20}\$_\beta\}(\Omega + \dot{\zeta})\ \dot{q}_1 + 2\{\Gamma_{53} - \Gamma_{51} + \Gamma_{57} \\
&- \Gamma_{55}\}\ \dot{\beta}^2 + 2\{q_1[\Gamma_{47} - \Gamma_{48}]\}\ \dot{\beta}\dot{q}_1 + 2\{-\Gamma_2\}(\theta + \dot{\delta})\ \dot{\delta} \\
&+ 2\{\Gamma_{20}\}\ \dot{\theta}\dot{q}_1 - \{\Gamma_{43} - \Gamma_{44} + \frac{q_1^2}{2} (\Gamma_{48} - \Gamma_{47})\}\ \ddot{\beta} \\
&+ \{-\Gamma_{17}\}\ \ddot{q}_1 + \{\Gamma_{19}\}\ \ddot{\theta} + \{\Gamma_3\}\ \ddot{\delta} + \{(e_2 - e_1)[\Gamma_{25} \\
&+ \Gamma_{22}] + [\Gamma_{42} + \Gamma_{45} - \frac{q_1^2}{2} (\Gamma_{46} + \Gamma_{49})]\ \text{¢}_\beta + \Gamma_{19}\$_\beta\}\ddot{\zeta} \\
&+ \{e_3^{\,2}M_{24} + I_{11} - 2e_3S_{44} + I_{34}\}\ \ddot{\theta}_{tw} + \{-e_3^{\,2}M_{27} - I_{12} \\
&+ 2e_3S_{47} + I_{35} + e_3^{\,2}M_{29} + I_{14} - 2e_3S_{49} + I_{37} + 1.0\}\ \theta_{tw}
\end{aligned}
\tag{33}
$$

Control Flap

$$
\begin{aligned}
\int \frac{\partial \chi^t}{\partial \delta}\, \ddot{\chi}\, dm = {} & \{-e_1(\Gamma_{11}\$_\beta - \Gamma_{12}\$_\zeta)\}\,\Omega^2 + \{-(e_2 - e_1)\,\Gamma_{11}\$_\beta \\
& - \Gamma_5\$_\beta\text{¢}_\beta + [(\Gamma_{34} + \Gamma_{40})\$_{(\theta+\delta)} - (\Gamma_{35} + \Gamma_{41})\text{¢}_{(\theta+\delta)}]\,\$_\beta{}^2 \\
& + [(\Gamma_{36} - \Gamma_{40})\$_{(\theta+\delta)} + (\Gamma_{35} - \Gamma_{39})\text{¢}_{(\theta+\delta)}]\}(\Omega + \dot{\zeta})^2 + 2\{ \\
& - \Gamma_6\$_\beta + [(\Gamma_{34} + \Gamma_{40})\text{¢}_{(\theta+\delta)} + (\Gamma_{35} + \Gamma_{41})\$_{(\theta+\delta)}]\text{¢}_\beta\}(\Omega + \dot{\zeta})\dot{\beta} \\
& + 2\{\Gamma_2\$_\beta\}(\Omega + \dot{\zeta})\,\dot{\theta} + 2\,\{-q_1\,\Gamma_{13}\text{¢}_\beta - S_{30}\$_\beta\$_\delta\}(\Omega + \dot{\zeta})\,\dot{q}_1 \\
& + \{(\Gamma_{34} + \Gamma_{40})\$_{(\theta+\delta)} - (\Gamma_{35} + \Gamma_{41})\text{¢}_{(\theta+\delta)}\}\dot{\beta}^2 + 2\{q\Gamma_{14}\}\,\dot{\beta}\dot{q}_1 \\
& + \{\Gamma_2\}\,\dot{\theta}^2 + 2\{-S_{30}\$_\delta\}\dot{\theta}\dot{q}_1 + \{(e_2 - e_1)\,\Gamma_{12} + \Gamma_6 C_\beta \\
& + \Gamma_3\$_\beta\}\ddot{\zeta} + \{-\Gamma_5\}\ddot{\beta} + \{\Gamma_3\}\,\ddot{\theta} + \{I_{28}\}\,\ddot{\delta} + \{-S_{30}\text{¢}_\delta\}\,\ddot{q}_1 \\
& + \{-e_3 S_{44} + I_{34}\}\,\ddot{\theta}_{tw} + \{e_3 S_{47} - I_{35} - e_3 S_{49} + I_{37}\}\,\theta_{tw}
\end{aligned}
\tag{34}
$$

Lead-Lag

$$
\begin{aligned}
\int \frac{\partial \chi^t}{\partial \zeta} \ddot{\chi}\, dm = & \{e_1(e_2 - e_1)\ \$_\zeta(M_1 + M_8) + e_1[\Gamma_1 \text{¢}_\beta \$_\zeta + (\Gamma_{22} \\
& +\Gamma_{25})\ \$_\beta \$_\zeta - (\Gamma_{23} - \Gamma_{24})\ \text{¢}_\zeta]\}\Omega^2 + 2\{(e_2 - e_1)[-\Gamma_1 \$_\beta \\
& + (\Gamma_{22} + \Gamma_{25})\ \text{¢}_\beta] - \Gamma_4 \$_\beta \text{¢}_\beta - [\Gamma_{42} + \Gamma_{45} - \frac{q_1^2}{2} (\Gamma_{46} \\
& + \Gamma_{49})](\text{¢}_\beta^2 - \$_\beta^2) + [\Gamma_{50} + 2\Gamma_{54} + \Gamma_{58}]\ \text{¢}_\beta \$_\beta\}(\Omega + \dot{\zeta})\ \dot{\beta} \\
& + 2\{(e_2 - e_1)(\Gamma_{23} - \Gamma_{24})\ \$_\beta + [\Gamma_{43} - \Gamma_{44} + \frac{q_1^2}{2} (\Gamma_{48} \\
& - \Gamma_{47})]\ \text{¢}_\beta \$_\beta - [\Gamma_{51} - \Gamma_{53} + \Gamma_{55} - \Gamma_{57}]\ \text{¢}_\beta^2\}(\Omega + \dot{\zeta})\ \dot{\theta} \\
& + 2\{(e_2 - e_1)\ \Gamma_{11} \$_\beta + \Gamma_5 \text{¢}_\beta \$_\beta - [(\Gamma_{34} + \Gamma_{40})\$_{(\theta+\delta)} - (\Gamma_{35} \\
& + \Gamma_{41})\text{¢}_{(\theta+\delta)}]\$_\beta^2 - (\Gamma_{35} - \Gamma_{39})\text{¢}_{(\theta+\delta)} - (\Gamma_{36} - \Gamma_{40})\$_{(\theta+\delta)}\}(\Omega \\
& + \dot{\zeta})\ \dot{\delta} + 2\{-(e_2 - e_1)[\Gamma_{15} \$_\beta + q_1(S_6 + S_{22})\ \text{¢}_\beta] - q_1 \Gamma_{21} \text{¢}_\beta^2 \\
& - q_1(\Gamma_{46} + \Gamma_{49})\ \text{¢}_\beta \$_\beta - (\Gamma_{10} - \frac{q_1^2}{2} \Gamma_7)\ \$_\beta \text{¢}_\beta + [(\Gamma_{26} \\
& + \Gamma_{30})\ \$_\theta - (\Gamma_{27} + \Gamma_{31})\ \text{¢}_\theta]\ \$_\beta^2 + (\Gamma_{27} - \Gamma_{29})\ \text{¢}_\theta \\
& + (\Gamma_{28} - \Gamma_{30})\ \$_\theta\}(\Omega + \dot{\zeta})\ \dot{q}_1 + \{-[\Gamma_{43} - \Gamma_{44} + \frac{q_1^2}{2} (\Gamma_{48} \\
& - \Gamma_{47})]\ \text{¢}_\beta - [\Gamma_{51} - \Gamma_{53} + \Gamma_{55} - \Gamma_{57}]\ \$_\beta\}\ \dot{\beta}^2 + 2\{[\Gamma_{52} \\
& - 2\Gamma_{54} + \Gamma_{56}]\ \text{¢}_\beta\}\ \dot{\beta}\dot{\theta} + 2\{(\Gamma_{36} - \Gamma_{40})\text{¢}_{(\theta+\delta)} - (\Gamma_{35}
\end{aligned}
$$

Lead-Lag (Continued)

$$
\begin{aligned}
&- \Gamma_{39})\$_{(\theta+\delta)}\}\dot{\beta}\dot{\delta} + 2\{[(\Gamma_{27} - \Gamma_{29})\ \$_{\theta} - (\Gamma_{28} - \Gamma_{30})\ \text{¢}_{\theta}]\ \text{¢}_{\beta} \\
&+ q_1(\Gamma_{47} - \Gamma_{48})\ \$_{\beta}\}\dot{\beta}\dot{q}_1 + \{(e_2 - e_1)(\Gamma_{23} - \Gamma_{24}) + [\Gamma_{43} \\
&- \Gamma_{44} + \frac{q_1^{2}}{2}(\Gamma_{48} - \Gamma_{47})]\ \text{¢}_{\beta}\}\ \dot{\theta}^{2} + \{(e_2 - e_1)\ \Gamma_{11} + \Gamma_5\text{¢}_{\beta} \\
&- \Gamma_2\$_{\beta}\}(2\dot{\theta} + \dot{\delta})\ \dot{\delta} + 2\{-(e_2 - e_1)\ \Gamma_{15} - [\Gamma_{10} - \frac{q_1^{2}}{2}\Gamma_7]\ \text{¢}_{\beta} \\
&+ \Gamma_{20}\$_{\beta}\}\dot{\theta}\dot{q}_1 + \{[\Gamma_{48} - \Gamma_{47}]\ \text{¢}_{\beta}\}\ \dot{q}_1^{2} + \{-[\Gamma_{43} - \Gamma_{44} \\
&+ \frac{q_1^{2}}{2}(\Gamma_{48} - \Gamma_{47})]\ \$_{\beta} + [\Gamma_{51} - \Gamma_{55} + \Gamma_{51} - \Gamma_{57}]\ \text{¢}_{\beta}\}\ \ddot{\beta} \\
&+ \{(e_2 - e_1)(\Gamma_{25} + \Gamma_{22}) + [\Gamma_{42} + \Gamma_{45} - \frac{q_1^{2}}{2}(\Gamma_{46} + \Gamma_{49})]\ \text{¢}_{\beta} \\
&+ \Gamma_{19}\$_{\beta}\}\ \ddot{\theta} + \{(e_2 - e_1)\ \Gamma_{12} + \Gamma_6\text{¢}_{\beta} + \Gamma_3\$_{\beta}\}\ \ddot{\delta} + \{-(e_2 \\
&- e_1)\ \Gamma_{16} - (\Gamma_9 - \frac{q_1^{2}}{2}\Gamma_8)\ \text{¢}_{\beta} - q_1(\Gamma_{48} - \Gamma_{47})\ \text{¢}_{\beta} \\
&- \Gamma_{17}\$_{\beta}\}\ddot{q}_1 + \{(e_2 - e_1)^{2}(M_1 + M_8) + 2(e_2 - e_1)[\Gamma_1\text{¢}_{\beta} \\
&+ (\Gamma_{22} + \Gamma_{25})\ \$_{\beta}] + \Gamma_4\text{¢}_{\beta}^{2} + [\Gamma_{42} + \Gamma_{45} - \frac{q_1^{2}}{2}(\Gamma_{46} \\
&+ \Gamma_{49})]\ \text{¢}_{\beta}\$_{\beta} + \Gamma_{52} + \Gamma_{56} + \Gamma_{50} + \Gamma_{58} - [\Gamma_{50} + 2\Gamma_{54} \\
&+ \Gamma_{58}]\ \text{¢}_{\beta}^{2}\}\ \ddot{\zeta} + \{(e_2 - e_1)(S_{13} - e_3M_{25} + S_{45})\}\ \ddot{\theta}_{tw} \\
&+ \{-2(e_3^{2}M_{28} + I_{13} - 2e_3S_{49} + I_{36})\}\ \dot{\theta}_{tw} + \{e_1(S_{13} \\
&- e_3M_{25} + S_{45})\}\ \theta_{tw}
\end{aligned}
\qquad (35)
$$

Twisting

$$\int \frac{\partial \chi^t}{\partial \theta_{tw}} \ddot{\chi}\, dm = \{e_3^2 M_{28} + I_{13} - 2e_3 S_{48} + I_{36}\} \Omega^2 + \{e_1 S_{13}$$

$$- e_1 e_3 M_{25} + e_1 S_{45}\} \Omega^2 \zeta + \{e_3 S_{43} - I_5 - I_{26} + e_2 (e_3 M_{26}$$

$$- S_{14} - S_{46})\} \Omega^2 \beta + \{-e_3^2 M_{27} - I_{12} + 2e_3 S_{47} + I_{35}$$

$$+ e_3^2 M_{29} + I_{14} - 2e_3 S_{49} + I_{37}\} \Omega^2 \theta + \{e_3 S_{47} - I_{35}$$

$$- e_3 S_{49} + I_{37}\} \Omega^2 \delta + \{e_3 M_{37} - S_{18} - S_{57}\} \Omega^2 q_1 + \{-e_3^2 M_{31}$$

$$- I_{16} + 2e_3 S_{51} + I_{39} + \{e_3^2 M_{33} + I_{18} - 2e_3 S_{52} + I_{41}\} \Omega^2 \theta_{tw}$$

$$+ 2\{e_3^2 M_{28} + I_{13} - 2e_3 S_{48} + I_{36}\} \Omega \dot{\zeta} + 2\{e_3^2 M_{27} + I_{12}$$

$$- 2e_3 S_{47} + I_{35}\} \Omega \dot{\beta} + \{(e_2 - e_1)(S_{13} - e_3 M_{25} + S_{45})$$

$$+ I_4 - e_3 S_{42} + I_{25}\} \ddot{\zeta} + \{e_1 S_{13} - e_1 e_3 M_{25} + e_1 S_{45}\} \ddot{\beta}$$

$$+ \{e_3^2 M_{24} + I_{11} - 2e_3 S_{44} + I_{34}\} \ddot{\theta} + \{I_{34} - e_3 S_{44}\} \ddot{\zeta}$$

$$+ \{e_3 M_{34} - S_{15} - S_{54}\} \ddot{q}_1 + \{e_3 M_{30} + I_{15} - 2e_3 S_{50} + I_{38}\} \ddot{\theta}_{tw} \qquad (36)$$

The substitution parameters used in Equations (31) through (36) consist of convenient groupings of various inertia integrals as defined by the following relations.

$$\Gamma_1 = S_1 + S_{19} - (q_1^2/2)(S_{10} + S_{36})$$

$$\Gamma_2 = -e_3 S_{24} \$_\delta + q_1 S_{30} ¢_\delta$$

$$\Gamma_3 = -e_3 S_{24} ¢_\delta - q_1 S_{30} \$_\delta + I_{28}$$

$$\Gamma_4 = I_1 + I_{22} - q_1^2 (I_6 + I_{27}) + (q_1^4/4)(I_{21} + S_{39})$$

$$\Gamma_5 = -I_{23} \$_{(\theta+\delta)} + I_{24} ¢_{(\theta+\delta)} + (q_1^2/2)(I_{42} \$_{(\theta+\delta)} - I_{43} ¢_{(\theta+\delta)}$$

$$\Gamma_6 = I_{23} ¢_{(\theta+\delta)} + I_{24} \$_{(\theta+\delta)} - (q_1^2/2)(I_{42} ¢_{(\theta+\delta)} + I_{43} \$_{(\theta+\delta)}$$

$$\Gamma_7 = (S_{12} + S_{41})\ ¢_\theta - (S_{11} + S_{40})\ \$_\theta$$

$$\Gamma_8 = (S_{12} + S_{41})\ \$_\theta + (S_{11} + S_{40})\ ¢_\theta$$

$$\Gamma_9 = (S_3 + S_{23})\ \$_\theta + (S_2 + S_{22})\ ¢_\theta$$

$$\Gamma_{10} = (S_3 + S_{23})\ ¢_\theta - (S_2 + S_{22})\ \$_\theta$$

$$\Gamma_{11} = S_{26} ¢_{(\theta+\delta)} - S_{25} \$_{(\theta+\delta)}$$

$$\Gamma_{12} = S_{26} \$_{(\theta+\delta)} + S_{25} ¢_{(\theta+\delta)}$$

$$\Gamma_{13} = I_{42} ¢_{(\theta+\delta)} + I_{43} \$_{(\theta+\delta)}$$

$$\Gamma_{14} = I_{42} \$_{(\theta+\delta)} - I_{43} ¢_{(\theta+\delta)}$$

$$\Gamma_{15} = (M_3 + M_{16})\ ¢_\theta - (M_2 + M_{15})\ \$_\theta$$

$$\Gamma_{16} = (M_3 + M_{16})\ \$_\theta + (M_2 + M_{15})\ ¢_\theta$$

$$\Gamma_{17} = -e_3 M_{14} + S_6 + S_{30}\text{¢}_\delta$$

$$\Gamma_{18} = -e_3[S_{37}\text{¢}_\theta + S_{38}\$_\theta] + I_{19}\text{¢}_\theta + I_{20}\$_\theta$$

$$\Gamma_{19} = e_3^2 M_8 + I_7 - 2e_3 S_{24}\text{¢}_\delta + I_{28} - 2q_1 S_{30}\$_\delta + q_1^2(M_4 + M_{20})$$

$$\Gamma_{20} = q_1(M_4 + M_{20}) - S_{30}\$_\delta$$

$$\Gamma_{21} = I_6 + I_{27} - (q_1^2/2)(I_{21} + S_{39})$$

$$\Gamma_{22} = (S_4 - e_3 M_9)\ \text{¢}_\theta + q_1(M_2 + M_{15})\ \$_\theta + S_{25}\text{¢}_{(\theta+\delta)}$$

$$\Gamma_{23} = (S_5 - e_3 M_{10})\ \text{¢}_\theta + q_1(M_3 + M_{16})\ \$_\theta + S_{26}\text{¢}_{(\theta+\delta)}$$

$$\Gamma_{24} = (S_4 - e_3 M_9)\ \$_\theta - q_1(M_2 + M_{15})\ \text{¢}_\theta + S_{25}\$_{(\theta+\delta)}$$

$$\Gamma_{25} = (S_5 - e_3 M_{10})\ \$_\theta - q_1(M_3 + M_{16})\ \text{¢}_\theta + S_{26}\$_{(\theta+\delta)}$$

$$\Gamma_{26} = (S_7 - e_3 M_{17})\ \text{¢}_\theta + q_1(M_5 + M_{21})\ \$_\theta + S_{33}\text{¢}_{(\theta+\delta)}$$

$$\Gamma_{27} = (S_8 - e_3 M_{18})\ \text{¢}_\theta + q_1(M_6 + M_{22})\ \$_\theta + S_{34}\text{¢}_{(\theta+\delta)}$$

$$\Gamma_{28} = (S_9 - e_3 M_{19})\ \text{¢}_\theta + q_1(M_7 + M_{23})\ \$_\theta + S_{35}\text{¢}_{(\theta+\delta)}$$

$$\Gamma_{29} = (S_7 - e_3 M_{17})\ \$_\theta - q_1(M_5 + M_{21})\ \text{¢}_\theta + S_{33}\$_{(\theta+\delta)}$$

$$\Gamma_{30} = (S_8 - e_3 M_{18})\ \$_\theta - q_1(M_6 + M_{22})\ \text{¢}_\theta + S_{34}\$_{(\theta+\delta)}$$

$$\Gamma_{31} = (S_9 - e_3 M_{19})\ \$_\theta - q_1(M_7 + M_{23})\ \text{¢}_\theta + S_{35}\$_{(\theta+\delta)}$$

$$\Gamma_{32} = -e_3 S_{25}\text{¢}_\theta + q_1 S_{31}\$_\theta + I_{29}\text{¢}_{(\theta+\delta)}$$

$$\Gamma_{33} = -e_3 S_{26} \text{¢}_\theta + q_1 S_{32} \$_\theta + I_{30} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{34} = -e_3 S_{27} \text{¢}_\theta + q_1 S_{33} \$_\theta + I_{31} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{35} = -e_3 S_{28} \text{¢}_\theta + q_1 S_{34} \$_\theta + I_{32} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{36} = -e_3 S_{29} \text{¢}_\theta + q_1 S_{35} \$_\theta + I_{33} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{37} = -e_3 S_{24} \$_\theta - q_1 S_{31} \text{¢}_\theta + I_{29} \$_{(\theta+\delta)}$$

$$\Gamma_{38} = -e_3 S_{26} \$_\theta - q_1 S_{32} \text{¢}_\theta + I_{30} \$_{(\theta+\delta)}$$

$$\Gamma_{39} = -e_3 S_{27} \$_\theta - q_1 S_{33} \text{¢}_\theta + I_{31} \$_{(\theta+\delta)}$$

$$\Gamma_{40} = -e_3 S_{28} \$_\theta - q_1 S_{34} \text{¢}_\theta + I_{32} \$_{(\theta+\delta)}$$

$$\Gamma_{41} = -e_3 S_{29} \$_\theta - q_1 S_{35} \text{¢}_\theta + I_{33} \$_{(\theta+\delta)}$$

$$\Gamma_{42} = (I_2 - e_3 S_{20})\ \text{¢}_\theta + q_1(S_2 + S_{22})\ \$_\theta + I_{23} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{43} = (I_3 - e_3 S_{21})\ \text{¢}_\theta + q_1(S_3 + S_{23})\ \$_\theta + I_{24} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{44} = (I_2 - e_3 S_{20})\ \$_\theta - q_1(S_2 + S_{22})\ \text{¢}_\theta + I_{23} \$_{(\theta+\delta)}$$

$$\Gamma_{45} = (I_3 - e_3 S_{21})\ \$_\theta - q_1(S_3 + S_{23})\ \text{¢}_\theta + I_{24} \$_{(\theta+\delta)}$$

$$\Gamma_{46} = (I_{19} - e_3 S_{37})\ \text{¢}_\theta + q_1(S_{11} + S_{40})\ \$_\theta + I_{42} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{47} = (I_{20} - e_3 S_{38})\ \text{¢}_\theta + q_1(S_{12} + S_{41})\ \$_\theta + I_{43} \text{¢}_{(\theta+\delta)}$$

$$\Gamma_{48} = (I_{19} - e_3 S_{37})\ \$_\theta - q_1(S_{11} + S_{40})\ \text{¢}_\theta + I_{42} \$_{(\theta+\delta)}$$

$$\Gamma_{49} = (I_{20} - e_3S_{38})\ \$_\theta - q_1(S_{12} + S_{41})\ ¢_\theta + I_{43}\$_{(\theta+\delta)}$$

$$\Gamma_{50} = \{(e_3^2M_{11} + I_8)\ ¢^2_\theta + 2q_1(S_7 - e_3M_{17})\ \$_\theta¢_\theta$$
$$+ q_1^2(M_5 + M_{21})\ \$^2_\theta - 2e_3S_{27}¢_\theta¢_{(\theta+\delta)} + 2q_1S_{33}\$_\theta¢_{(\theta+\delta)}$$
$$+ I_{31}¢^2_{(\theta+\delta)}\}$$

$$\Gamma_{51} = \{(e_3^2M_{12} + I_9)\ ¢^2_\theta + 2q_1(S_8 - e_3M_{18})\ \$_\theta¢_\theta$$
$$+ q_1^2(M_6 + M_{22})\ \$^2_\theta - 2e_3S_{28}¢_\theta¢_{(\theta+\delta)} + 2q_1S_{34}\$_\theta¢_{(\theta+\delta)}$$
$$+ I_{32}¢^2_{(\theta+\delta)}\}$$

$$\Gamma_{52} = \{(e_3^2M_{13} + I_{10})\ ¢^2_\theta + 2q_1(S_9 - e_3M_{19})\ \$_\theta¢_\theta$$
$$+ 2e_3S_{29}¢_\theta¢_{(\theta+\delta)} + q_1^2(M_7 + M_{23})\ \$^2_\theta + 2q_1S_{35}\$_\theta¢_{(\theta+\delta)}$$
$$+ I_{33}¢^2_{(\theta+\delta)}\}$$

$$\Gamma_{53} = \{[(e_3^2M_{11} + I_8) - q_1^2(M_5 + M_{21})]\ \$_\theta¢_\theta + q_1(e_3M_{17} - S_7)\ ¢_{2\theta}$$
$$-e_3S_{27}\$_{(2\theta+\delta)} - q_1S_{33}¢_{(2\theta+\delta)} + I_{31}\$_{(\theta+\delta)}\ ¢_{(\theta+\delta)}\}$$

$$\Gamma_{54} = \{[(e_3^2M_{12} + I_9) - q_1^2(M_6 + M_{22})]\ \$_\theta¢_\theta + q_1(e_3M_{18} - S_8)\ ¢_{2\theta}$$
$$-e_3S_{28}\$_{(2\theta+\delta)} - q_1S_{34}¢_{(2\theta+\delta)} + I_{32}\$_{(\theta+\delta)}\ ¢_{(\theta+\delta)}\}$$

$$\Gamma_{55} = \{[(e_3^2 M_{13} + I_{10}) - q_1^2(M_7 + M_{23})]\ \$_\theta \text{¢}_\theta + q_1(e_3 M_{19} - S_9)\ \text{¢}_{2\theta}$$
$$- e_3 S_{29} \$_{(2\theta+\delta)} - q_1 S_{35} \text{¢}_{(2\theta+\delta)} + I_{33} \$_{(\theta+\delta)}\ \text{¢}_{(\theta+\delta)}\}$$

$$\Gamma_{56} = \{(e_3^2 M_{11} + I_8)\ \$_\theta^2 - 2q_1(S_7 - e_3 M_{17})\ \$_\theta \text{¢}_\theta - 2e_3 S_{27} \$_\theta \$_{(\theta+\delta)}$$
$$+ q_1^2(M_5 + M_{21})\ \text{¢}_\theta^2 - 2q_1 S_{33} \text{¢}_\theta \$_{(\theta+\delta)} + I_{31} \$^2_{(\theta+\delta)}\}$$

$$\Gamma_{57} = \{(e_3^2 M_{12} + I_9)\ \$_\theta^2 - 2q_1(S_8 - e_3 M_{18})\ \$_\theta \text{¢}_\theta + q_1^2(M_6$$
$$+ M_{22})\ \text{¢}_\theta^2 - 2e_3 S_{28} \$_\theta \$_{(\theta+\delta)} - 2q_1 S_{34} \text{¢}_\theta \$_{(\theta+\delta)} + I_{32} \$^2_{(\theta+\delta)}\}$$

$$\Gamma_{58} = \{(e_3^2 M_{13} + I_{10})\ \$_\theta^2 - 2q_1(S_9 - e_3 M_{19})\ \$_\theta \text{¢}_\theta + q_1^2(M_7$$
$$+ M_{23})\ \text{¢}_\theta^2 - 2e_3 S_{29} \$_\theta \$_{(\theta+\delta)} - 2q_1 S_{35} \text{¢}_\theta \$_{(\theta+\delta)} + I_{33} \$^2_{(\theta+\delta)}\}$$

TABLE IV. MASS INTEGRALS

$M_1 = \int dm_1$	$M_{14} = \int \phi_o dm_2$
$M_2 = \int \phi_o \$_{\theta_x} dm_1$	$M_{15} = \int \phi_o \$_{\theta_x} dm_2$
$M_3 = \int \phi_o \text{¢}_{\theta_x} dm_1$	$M_{16} = \int \phi_o \text{¢}_{\theta_x} dm_2$
$M_4 = \int \phi_o^2 dm_1$	$M_{17} = \int \phi_o \$_{\theta_x}^2 dm_2$
$M_5 = \int \phi_o^2 \$_{\theta_x}^2 dm_1$	$M_{18} = \int \phi_o \$_{\theta_x} \text{¢}_{\theta_x} dm_2$
$M_6 = \int \phi_o^2 \$_{\theta_x} \text{¢}_{\theta_x} dm_1$	$M_{19} = \int \phi_o \text{¢}_{\theta_x}^2 dm_2$
$M_7 = \int \phi_o^2 \text{¢}_{\theta_x}^2 dm_1$	$M_{20} = \int \phi_o^2 dm_2$
$M_8 = \int dm_2$	$M_{21} = \int \phi_o^2 \$_{\theta_x}^2 dm_2$
$M_9 = \int \$_{\theta_x} dm_2$	$M_{22} = \int \phi_o^2 \$_{\theta_x} \text{¢}_{\theta_x} dm_2$
$M_{10} = \int \text{¢}_{\theta_x} dm_2$	$M_{23} = \int \phi_o^2 \text{¢}_{\theta_x}^2 dm_2$
$M_{11} = \int \$_{\theta_x}^2 dm_2$	$M_{24} = \int \phi_{tw} dm_2$
$M_{12} = \int \$_{\theta_x} \text{¢}_{\theta_x} dm_2$	$M_{25} = \int \phi_{tw} \$_{\theta_x} dm_2$
$M_{13} = \int \text{¢}_{\theta_x}^2 dm_2$	$M_{26} = \int \phi_{tw} \text{¢}_{\theta_x} dm_2$

TABLE IV - Continued

$$M_{27} = \int \phi_{tw} \$_{\theta_x}^{\,2} dm_2$$

$$M_{28} = \int \phi_{tw} \$_{\theta_x} \text{¢}_{\theta_x} dm_2$$

$$M_{29} = \int \phi_{tw} \text{¢}_{\theta_x}^{\,2} dm_2$$

$$M_{30} = \int \phi_{tw}^{\,2} dm_2$$

$$M_{31} = \int \phi_{tw}^{\,2} \$_{\theta_x}^{\,2} dm_2$$

$$M_{32} = \int \phi_{tw}^{\,2} \$_{\theta_x} \text{¢}_{\theta_x} dm_2$$

$$M_{33} = \int \phi_{tw}^{\,2} \text{¢}_{\theta_x}^{\,2} dm_2$$

$$M_{34} = \int \phi_{tw} \phi_o dm_2$$

$$M_{35} = \int \phi_{tw} \phi_o \$_{\theta_x}^{\,2} dm_2$$

$$M_{36} = \int \phi_{tw} \phi_o \$_{\theta_x} \text{¢}_{\theta_x} dm_2$$

$$M_{37} = \int \phi_{tw} \phi_o \text{¢}_{\theta_x}^{\,2} dm_2$$

TABLE V. STATIC MOMENT INTEGRALS

$S_1 = \int (r - e_2)\ dm_1$	$S_{14} = \int (-\xi_1)\ \phi_{tw} \text{¢}_{\theta_x} dm_1$
$S_2 = \int (r - e_2)\ \phi_o \$_{\theta_x} dm_1$	$S_{15} = \int (-\xi_1)\ \phi_o \phi_{tw} dm_1$
$S_3 = \int (r - e_2)\ \phi_o \text{¢}_{\theta_x} dm_1$	$S_{16} = \int (-\xi_1)\ \phi_o \phi_{tw} \$_{\theta_x}^2 dm_1$
$S_4 = \int (-\xi_1)\ \$_{\theta_x} dm_1$	$S_{17} = \int (-\xi_1)\ \phi_o \phi_{tw} \$_{\theta_x} \text{¢}_{\theta_x} dm_1$
$S_5 = \int (-\xi_1)\ \text{¢}_{\theta_x} dm_1$	$S_{18} = \int (-\xi_1)\ \phi_o \phi_{tw} \text{¢}_{\theta_x}^2 dm_1$
$S_6 = \int (-\xi_1)\ \phi_o dm_1$	$S_{19} = \int (r - e_2)\ dm_2$
$S_7 = \int (-\xi_1)\ \phi_o \$_{\theta_x}^2 dm_1$	$S_{20} = \int (r - e_2)\ \$_{\theta_x} dm_2$
$S_8 = \int (-\xi_1)\ \phi_o \$_{\theta_x} \text{¢}_{\theta_x} dm_1$	$S_{21} = \int (r - e_2)\ \text{¢}_{\theta_x} dm_2$
$S_9 = \int (-\xi_1)\ \phi_o \text{¢}_{\theta_x}^2 dm_1$	$S_{22} = \int (r - e_2)\ \phi_o \$_{\theta_x} dm_2$
$S_{10} = \int \left\{ \int \phi_o'^2 d\eta \right\} dm_1$	$S_{23} = \int (r - e_2)\ \phi_o \text{¢}_{\theta_x} dm_2$
$S_{11} = \int \left\{ \int \phi_o'^2 d\eta \right\} \phi_o \$_{\theta_x} dm_1$	$S_{24} = \int (-\xi_2)\ dm_2$
$S_{12} = \int \left\{ \int \phi_o'^2 d\eta \right\} \phi_o \text{¢}_{\theta_x} dm_1$	$S_{25} = \int (-\xi_2)\ \$_{\theta_x} dm_2$
$S_{13} = \int (-\xi_1)\ \phi_{tw} \$_{\theta_x} dm_1$	$S_{26} = \int (-\xi_2)\ \text{¢}_{\theta_x} dm_2$

TABLE V - Continued

$$S_{27} = \int (-\xi_2)\ \$_{\theta_x}{}^2\, dm_2$$

$$S_{28} = \int (-\xi_2)\ \$_{\theta_x} ¢_{\theta_x}\, dm_2$$

$$S_{29} = \int (-\xi_2)\ ¢_{\theta_x}{}^2\, dm_2$$

$$S_{30} = \int (-\xi_2)\ \phi_o\, dm_2$$

$$S_{31} = \int (-\xi_2)\ \phi_o \$_{\theta_x}\, dm_2$$

$$S_{32} = \int (-\xi_2)\ \phi_o ¢_{\theta_x}\, dm_2$$

$$S_{33} = \int (-\xi_2)\ \phi_o \$_{\theta_x}{}^2\, dm_2$$

$$S_{34} = \int (-\xi_2)\ \phi_o \$_{\theta_x} ¢_{\theta_x}\, dm_2$$

$$S_{35} = \int (-\xi_2)\ \phi_o ¢_{\theta_x}{}^2\, dm_2$$

$$S_{36} = \int \left\{ \int \phi_o'^2\, d\eta \right\} dm_2$$

$$S_{37} = \int \left\{ \int \phi_o'^2\, d\eta \right\} \$_{\theta_x}\, dm_2$$

$$S_{38} = \int \left\{ \int \phi_o'^2\, d\eta \right\} ¢_{\theta_x}\, dm_2$$

$$S_{39} = \int \left\{ \int \phi_o'^2\, d\eta \right\} \phi_o\, dm_2$$

$$S_{40} = \int \left\{ \int \phi_o'^2\, d\eta \right\} \phi_o \$_{\theta_x}\, dm_2$$

$$S_{41} = \int \left\{ \int \phi_o'^2\, d\eta \right\} \phi_o ¢_{\theta_x}\, dm_2$$

$$S_{42} = \int (r - e_2)\ \phi_{tw} \$_{\theta_x}\, dm_2$$

$$S_{43} = \int (r - e_2)\ \phi_{tw} ¢_{\theta_x}\, dm_2$$

$$S_{44} = \int (-\xi_2)\ \phi_{tw}\, dm_2$$

$$S_{45} = \int (-\xi_2)\ \phi_{tw} \$_{\theta_x}\, dm_2$$

$$S_{46} = \int (-\xi_2)\ \phi_{tw} ¢_{\theta_x}\, dm_2$$

$$S_{47} = \int (-\xi_2)\ \phi_{tw} \$_{\theta_x}{}^2\, dm_2$$

$$S_{48} = \int (-\xi_2)\ \phi_{tw} \$_{\theta_x} ¢_{\theta_x}\, dm_2$$

$$S_{49} = \int (-\xi_2)\ \phi_{tw} ¢_{\theta_x}{}^2\, dm_2$$

$$S_{50} = \int (-\xi_2)\ \phi_{tw}{}^2\, dm_2$$

$$S_{51} = \int (-\xi_2)\ \phi_{tw}{}^2 \$_{\theta_x}{}^2\, dm_2$$

$$S_{52} = \int (-\xi_2)\ \phi_{tw}{}^2 \$_{\theta_x} ¢_{\theta_x}\, dm_2$$

TABLE V - Continued

$$S_{53} = \int (-\xi_2)\ \phi_{tw}\ \phi_{\theta_x}^{2}\ dm_2$$

$$S_{54} = \int (-\xi_2)\ \phi_{tw}\phi_o\ dm_2$$

$$S_{55} = \int (-\xi_2)\ \phi_{tw}\phi_o\phi_{\theta_x}^{2}\ dm_2$$

$$S_{56} = \int (-\xi_2)\ \phi_{tw}\phi_o\phi_{\theta_x}\phi_{\theta_x}\ dm_2$$

$$S_{57} = \int (-\xi_2)\ \phi_{tw}\phi_o\phi_{\theta_x}^{2}\ dm_2$$

TABLE VI - Continued

$$I_{27} = \int (r - e_2)\left\{\int \phi_o'^{\,2}\, d\eta\right\} dm_2$$

$$I_{28} = \int \xi_2^{\,2}\, dm_2$$

$$I_{29} = \int \xi_2^{\,2}\, \$_{\theta_x}\, dm_2$$

$$I_{30} = \int \xi_2^{\,2}\, \text{¢}_{\theta_x}\, dm_2$$

$$I_{31} = \int \xi_2^{\,2}\, \$_{\theta_x}^{\,2}\, dm_2$$

$$I_{32} = \int \xi_2^{\,2}\, \$_{\theta_x} \text{¢}_{\theta_x}\, dm_2$$

$$I_{33} = \int \xi_2^{\,2}\, \text{¢}_{\theta_x}^{\,2}\, dm_2$$

$$I_{34} = \int \xi_2^{\,2}\, \phi_{tw}\, dm_2$$

$$I_{35} = \int \xi_2^{\,2}\, \phi_{tw} \$_{\theta_x}^{\,2}\, dm_2$$

$$I_{36} = \int \xi_2^{\,2}\, \phi_{tw} \$_{\theta_x} \text{¢}_{\theta_x}\, dm_2$$

$$I_{37} = \int \xi_2^{\,2}\, \phi_{tw} \text{¢}_{\theta_x}^{\,2}\, dm_2$$

$$I_{38} = \int \xi_2^{\,2}\, \phi_{tw}^{\,2}\, dm_2$$

$$I_{39} = \int \xi_2^{\,2}\, \phi_{tw}^{\,2}\, \$_{\theta_x}^{\,2}\, dm_2$$

$$I_{40} = \int \xi_2^{\,2}\, \phi_{tw}^{\,2}\, \$_{\theta_x} \text{¢}_{\theta_x}\, dm_2$$

$$I_{41} = \int \xi_2^{\,2}\, \phi_{tw}^{\,2}\, \text{¢}_{\theta_x}^{\,2}\, dm_2$$

$$I_{42} = \int (-\xi_2)\left\{\int \phi_o'^{\,2}\, d\eta\right\} \$_{\theta_x}\, dm_2$$

$$I_{43} = \int (-\xi_2)\left\{\int \phi_o'^{\,2}\, d\eta\right\} \text{¢}_{\theta_x}\, dm_2$$

$$\frac{Q_\beta}{I_1\Omega^2} = \frac{\gamma}{2} \int \bar{U}^2 \frac{c}{c_o} \frac{(x - e_2)}{a_o} \{[c_\ell + \frac{\partial c_\ell}{\partial \delta} \delta + \frac{c}{R\bar{U}} (\frac{\partial c_\ell}{\partial \dot{\alpha}} \dot{\alpha}$$

$$+ \frac{\partial c_\ell}{\partial \dot{\delta}} \dot{\delta})]\text{¢}_{\phi_v} + [c_d + \frac{\partial c_d}{\partial \delta} \delta]\$_{\phi_v}\} \, dx \tag{37}$$

$$\frac{Q_\theta}{I_1\Omega^2} = \frac{\gamma}{2}\int\bar{U}^2 \frac{c^2}{c_o R a_o} \{c_{m_\theta} + \frac{\partial c_{m_\theta}}{\partial \delta} \delta + \frac{c}{R\bar{U}} [\frac{\partial c_{m_\theta}}{\partial \dot{\alpha}} \dot{\alpha}$$

$$+ \frac{\partial c_{m_\theta}}{\partial \dot{\delta}} \dot{\delta}] + \frac{\xi_a}{c} [\; c_\ell + \frac{c}{R\bar{U}}(\frac{\partial c_\ell}{\partial \dot{\alpha}} \dot{\alpha} + \frac{\partial c_\ell}{\partial \delta} \dot{\delta}) \; \text{¢}_\alpha$$

$$+ (c_d + \frac{\partial c_d}{\partial \delta} \delta)\$_\alpha]\} \, dx \tag{38}$$

$$\frac{Q_\delta}{I_1\Omega^2} = \frac{\gamma}{2} \int\bar{U}^2 \frac{c^2}{c_o R a_o} \{c_{m_\delta} + \frac{\partial c_{m_\delta}}{\partial \delta} \delta + \frac{c}{R\bar{U}} (\frac{\partial c_{m_\delta}}{\partial \dot{\delta}} \dot{\delta}$$

$$+ \frac{\partial c_{m_\delta}}{\partial \dot{\alpha}} \dot{\alpha}) + \frac{\xi_\delta \Delta c}{c^2} [c_\ell + \frac{\partial c_\ell}{\partial \delta} \delta + \frac{c}{R\bar{U}} (\frac{\partial c_\ell}{\partial \dot{\alpha}} \dot{\alpha}$$

$$+ \frac{\partial c_\ell}{\partial \dot{\delta}} \dot{\delta}) - \frac{\partial \alpha}{\partial \delta}(\frac{\partial c_\ell}{\partial \alpha} \delta + \frac{\Delta c}{R\bar{U}} \frac{\partial c_\ell}{\partial \dot{\alpha}} \dot{\delta})]\} \, dx \tag{39}$$

$$\frac{Q_\zeta}{I_1\Omega^2} = \frac{\gamma}{2} \int\bar{U}^2 \frac{c(x - e_1)}{c_o a_o} \{c_\ell + \frac{\partial c_\ell}{\partial \delta} \delta + \frac{c}{R\bar{U}} (\frac{\partial c_\ell}{\partial \dot{\alpha}} \dot{\alpha}$$

$$+ \frac{\partial c_\ell}{\partial \delta} \dot{\delta})]\$_{\phi_v} - [c_d + \frac{\partial c_d}{\partial \delta} \delta]\text{¢}_{\phi_v}\} \, dx \tag{40}$$

$$\frac{Q_q}{I_1\Omega^2} = \frac{\gamma}{2}\int \overline{U}^2 \frac{c}{c_o a_o} \frac{\phi_o}{R} \{c_\ell + \frac{\partial c_\ell}{\partial \delta}\delta + \frac{c}{R\overline{U}} (\frac{\partial c_\ell}{\partial \dot{\alpha}}\dot{\alpha}$$

$$+ \frac{\partial c_\ell}{\partial \dot{\delta}}\dot{\delta}] ¢_\alpha + [c_d + \frac{\partial c_d}{\partial \delta}\delta] \$_\alpha\} dx \qquad (41)$$

$$\frac{Q_{\theta_{tw}}}{I_1\Omega^2} = \frac{\gamma}{2}\int \overline{U}^2 \frac{c\phi_{tw}}{c_o R a_o} \{c_{m_\theta} + \frac{\partial c_{m_\theta}}{\partial \delta}\delta + \frac{c}{R\overline{U}} [\frac{\partial c_{m_\theta}}{\partial \dot{\alpha}}\dot{\alpha} + \frac{\partial c_{m_\theta}}{\partial \dot{\delta}}\dot{\delta}]$$

$$+ \frac{\xi_a}{c}[c_\ell + \frac{c}{R\overline{U}} (\frac{\partial c_\ell}{\partial \dot{\alpha}}\dot{\alpha} + \frac{\partial c_\ell}{\partial \dot{\delta}}\dot{\delta}) ¢_\alpha + (c_d + \frac{\partial c_d}{\partial \delta}\delta)\$_\alpha]\}dx$$

where

$$\alpha = \theta + \theta_x + \tan^{-1}\frac{U_p}{U_t} + (\frac{1}{2} + \frac{\xi_a}{c})\frac{c}{U}\frac{d\theta}{d\psi}$$

$$+ (\frac{1}{2} + \frac{\xi_a + \Delta\xi_a}{c + \Delta c})(\frac{(c + \Delta c)\Omega}{U}\frac{d\alpha}{d\delta}\frac{d\delta}{d\psi} + ¢_{tw}\phi_{tw} \qquad (42)$$

$$U_p = \Omega R\{\lambda ¢_\beta - (x - \overline{e}_2 - \frac{q_1^2}{2}\int_o^r \phi_1'^2 dr)\frac{d\beta}{d\psi} - ¢_{\theta+\theta_x}\frac{\phi_1}{R}\frac{dq_1}{d\psi}$$

$$+ \$_{\theta+\theta_x}\frac{\phi}{R} q_1 \frac{d\theta}{d\psi} - \mu \$_\beta ¢_\psi\} \qquad (43)$$

$$U_t = \Omega R\{\overline{e}_1 + [\overline{e}_2 - \overline{e}_1 + (x - \overline{e}_2 - \frac{q_1^2}{2}\int_o^r \phi_1'^2 dr) ¢_\beta (1 + \frac{d\zeta}{d\psi})$$

$$+ \mu \$_{\psi+\zeta} - \frac{q_1\phi}{R} ¢_{\theta+\theta_x}\frac{d\theta}{d\psi} - \frac{1}{R}\$_{\theta+\theta_x}\frac{dq_1}{d\psi}\} \qquad (44)$$

$$U^2 = U_t^2 + U_p^2 \qquad (45)$$

$$\frac{Q_q}{I_1\Omega^2} = \frac{\gamma}{2}\int \bar{U}^2 \frac{c}{c_o a_o}\frac{\phi_o}{R}\{c_\ell + \frac{\partial c_\ell}{\partial\delta}\delta + \frac{c}{R\bar{U}}(\frac{\partial c_\ell}{\partial\dot{\alpha}}\dot{\alpha}$$

$$+ \frac{\partial c_\ell}{\partial\dot{\delta}}\dot{\delta}]¢_\alpha + [c_d + \frac{\partial c_d}{\partial\delta}\delta]\$_\alpha\}\,dx \tag{41}$$

$$\frac{Q_{\theta_{tw}}}{I_1\Omega^2} = \frac{\gamma}{2}\int \bar{U}^2 \frac{c\phi_{tw}}{c_o R a_o}\{c_{m_\theta} + \frac{\partial c_{m_\theta}}{\partial\delta}\delta + \frac{c}{R\bar{U}}[\frac{\partial c_{m_\theta}}{\partial\dot{\alpha}}\dot{\alpha} + \frac{\partial c_{m_\theta}}{\partial\dot{\delta}}\dot{\delta}]$$

$$+ \frac{\xi_a}{c}[c_\ell + \frac{c}{R\bar{U}}(\frac{\partial c_\ell}{\partial\dot{\alpha}}\dot{\alpha} + \frac{\partial c_\ell}{\partial\dot{\delta}}\dot{\delta})¢_\alpha + (c_d + \frac{\partial c_d}{\partial\delta}\delta)\$_\alpha]\}dx$$

where

$$\alpha = \theta + \theta_x + \tan^{-1}\frac{U_p}{U_t} + (\frac{1}{2} + \frac{\xi_a}{c})\frac{c}{U}\frac{d\theta}{d\psi}$$

$$+ (\frac{1}{2} + \frac{\xi_a + \Delta\xi_a}{c + \Delta c})(\frac{c + \Delta c)\Omega}{U}\frac{d\alpha}{d\delta}\frac{d\delta}{d\psi} + \phi_{tw}\phi_{tw} \tag{42}$$

$$U_p = \Omega R\{\lambda ¢_\beta - (x - \bar{e}_2 - \frac{q_1^2}{2}\int_o^r \phi_1'^2 dr)\frac{d\beta}{d\psi} - ¢_{\theta+\theta_x}\frac{\phi_1}{R}\frac{dq_1}{d\psi}$$

$$+ \$_{\theta+\theta_x}\frac{\phi}{R}q_1\frac{d\theta}{d\psi} - \mu\$_\beta ¢_\psi\} \tag{43}$$

$$U_t = \Omega R\{\bar{e}_1 + [\bar{e}_2 - \bar{e}_1 + (x - \bar{e}_2 - \frac{q_1^2}{2}\int_o^r \phi_1'^2 dr)¢_\beta(1 + \frac{d\zeta}{d\psi})$$

$$+ \mu\$_{\psi+\zeta} - \frac{q_1\phi}{R}¢_{\theta+\theta_x}\frac{d\theta}{d\psi} - \frac{1}{R}\$_{\theta+\theta_x}\frac{dq_1}{d\psi}\} \tag{44}$$

$$U^2 = U_t^2 + U_p^2 \tag{45}$$

APPENDIX II
LINEAR EQUATIONS OF MOTION

This appendix contains the linear equations of motion along with the definitions of the inertial portions and the aerodynamic portions of the linear coefficients.

LINEAR RESPONSE EQUATIONS

$$(C+T)_{1,1}\ddot{\theta} + (C+T)_{1,2}\dot{\theta} + (C+T)_{1,3} + (C+T)_{1,4}\ddot{q}_1$$
$$+ (C+T)_{1,5}\dot{q}_1 + (C+T)_{1,6}q_1 + (C+T)_{1,7}\ddot{\zeta}$$
$$+ (C+T)_{1,8}\dot{\zeta} + (C+T)_{1,9}\zeta + (C+T)_{1,10}\ddot{\beta}$$
$$+ (C+T)_{1,11}\dot{\beta} + (C+T)_{1,12}\beta + (C+T)_{1,13}\ddot{\delta}$$
$$+ (C+T)_{1,14}\dot{\delta} + (C+T)_{1,15}\delta + (C+T)_{1,16}\ddot{\theta}_{tw}$$
$$+ (C+T)_{1,17}\dot{\theta}_{tw} + (C+T)_{1,18}\theta_{tw} + (C+T)_{1,19} = 0$$

$$(C+T)_{2,1}\ddot{\theta} + (C+T)_{2,2}\dot{\theta} + \dots\dots\dots\dots (C+T)_{2,19} = 0$$

$$(C+T)_{3,1}\ddot{\theta} + (C+T)_{3,2}\dot{\theta} + \dots\dots\dots\dots (C+T)_{3,19} = 0$$

$$(C+T)_{4,1}\ddot{\theta} + (C+T)_{4,2}\dot{\theta} + \dots\dots\dots\dots (C+T)_{4,19} = 0$$

$$(C+T)_{5,1}\ddot{\theta} + (C+T)_{5,2}\dot{\theta} + \dots\dots\dots\dots (C+T)_{5,19} = 0$$

$$(C+T)_{6,1}\ddot{\theta} + (C+T)_{6,2}\dot{\theta} + \dots\dots\dots\dots (C+T)_{6,19} = 0$$

a. Primes indicate first and second derivatives with respect to azimuth.

b. Coefficients C and T are defined in the equations on the following pages.

LINEAR INERTIAL COEFFICIENTS

Pitch Degree of Freedom

$$C_{1,1} = e_3^2\bar{M}_8 + \bar{I}_7 - 2e_3\bar{S}_{24} + \bar{I}_{28} + \ell^2\bar{M}_w$$

$$C_{1,2} = \bar{C}_\theta/\Omega$$

$$C_{1,3} = -e_3^2\bar{M}_{11} - \bar{I}_8 + 2e_3\bar{S}_{27} - \bar{I}_{31} + e_3^2\bar{M}_{13} + \bar{I}_{10} - 2e_3\bar{S}_{29}$$
$$+ I_{33} + 1/\Omega^2 + \{\bar{K}_\theta + \bar{K}_{\theta_{input}} + \bar{K}_{\delta_{input}}\delta^2{}_\theta\} - \ell^2 \phi_{2\gamma}\bar{M}_w$$

$$C_{1,4} = e_3\bar{M}_{14} - \bar{S}_6 - S_{30}$$

$$C_{1,5} = 0$$

$$C_{1,6} = e_3\bar{M}_{19} - \bar{S}_9 - \bar{S}_{35} + \bar{S}_{33} = e_3\bar{M}_{17} + \bar{S}_7$$

$$C_{1,7} = (e_2 - e_1)(\bar{S}_4 - e_3\bar{M}_9 + \bar{S}_{25}) + \bar{I}_2 - e_3\bar{S}_{20} + \bar{I}_{23}$$
$$+ \ell\phi_\gamma\bar{M}_w(r_m - e_1)$$

$$C_{1,8} = 2(e_3^2\bar{M}_{12} + \bar{I}_9 - 2e_3\bar{S}_{28} + \bar{I}_{32})$$

$$C_{1,9} = (e_1\bar{S}_4 - e_1e_3\bar{M}_9 + e_1\bar{S}_{25}) + (\bar{K}_{\delta_{input}}\delta_\theta\delta_\zeta$$
$$- \bar{K}_{\theta_{input}}\theta_\zeta)(1/\Omega^2) + \ell e_1\phi_\gamma\bar{M}_w$$

$$C_{1,10} = (e_3\bar{S}_{21} - \bar{I}_3 - \bar{I}_{24}) - (r_m - e_1)\ \ell\$_\gamma\bar{M}_w$$

$$C_{1,11} = 2(e_3^2\bar{M}_{11} + \bar{I}_8 - 2e_3\bar{S}_{27} + \bar{I}_{31})$$

$$C_{1,12} = e_3\bar{S}_{21} - \bar{I}_3 - \bar{I}_{24} + e_2(e_3\bar{M}_{10} - \bar{S}_5 - \bar{S}_{26})$$
$$+ (1/\Omega^2)\{\bar{K}_{\delta_{input}}\delta_\beta\delta_\theta - \bar{K}_{\theta_{input}}\theta_\beta\} - (r_m - e_1)\ \ell\$_\gamma\bar{M}_w$$

$$C_{1,13} = \bar{I}_{28} - e_3\bar{S}_{24}$$

$$C_{1,14} = 0$$

$$C_{1,15} = e_3\bar{S}_{27} - \bar{I}_{31} - e_3\bar{S}_{29} + \bar{I}_{33} - \bar{K}_{\delta_{input}}\delta_\theta(1/\Omega^2)$$

$$C_{1,16} = e_3^2\bar{M}_{24} + \bar{I}_{11} - 2e_3\bar{S}_{44} + \bar{I}_{34}$$

$$C_{1,17} = 0$$

$$C_{1,18} = -e_3^2\bar{M}_{27} - \bar{I}_{12} + 2e_3\bar{S}_{47} + \bar{I}_{35} + e_3^2\bar{M}_{29} + \bar{I}_{14}$$
$$-2e_3\bar{S}_{49} + \bar{I}_{37}$$

$$C_{1,19} = + e_3^2\bar{M}_{12} + \bar{I}_9 - 2e_3\bar{S}_{28} + \bar{I}_{32} - (1/\Omega^2)\{\bar{K}_\theta\theta_o$$
$$+ \bar{K}_{\theta_{input}}(\theta_c + \theta_1\$_\psi + \theta_2\text{¢}_\psi + \theta_3\$_{2\psi} + \theta_4\text{¢}_{2\psi})$$
$$- \bar{K}_{\delta_{input}}\delta_\theta(\delta_c + \delta_1\$_\psi + \delta_2\text{¢}_\psi + \delta_3\$_{2\psi} + \delta_4\text{¢}_{2\psi})\}$$
$$+ \bar{M}_{cr}/\Omega^2 - (1/2)\ell^2\$_{2\gamma}\bar{M}_w$$

Bending Degree of Freedom

$$C_{2,1} = e_3\bar{M}_{14} - \bar{S}_6 - \bar{S}_{30}$$

$$C_{2,2} = 0$$

$$C_{2,3} = e_3\bar{M}_{19} - \bar{S}_9 + \bar{S}_{33} - \bar{S}_{35} - e_3\bar{M}_{17} + \bar{S}_7$$

$$C_{2,4} = \bar{M}_4 + \bar{M}_{20}$$

$$C_{2,5} = C_{q_1}/\Omega$$

$$C_{2,6} = \{e_2(\bar{S}_{10} + \bar{S}_{36}) - e_3\bar{S}_{37} + \bar{I}_6 + \bar{I}_{19} + \bar{I}_{27} + \bar{I}_{42}$$

$$- \bar{M}_6 - \bar{M}_{22} - \bar{M}_5 - \bar{M}_{21} + [\bar{M}_4 + \bar{M}_{20}](\omega^2_\eta/\Omega^2)\}$$

$$C_{2,7} = e_1\bar{M}_2 + e_1\bar{M}_{15} - e_2\bar{M}_2 - e_2\bar{M}_{15} - \bar{S}_2 - \bar{S}_{22}$$

$$C_{2,8} = -2(\bar{S}_8 - e_3\bar{M}_{18} + \bar{S}_{34})$$

$C_{2,9} = -e_1(\bar{M}_2$ [illegible] $\bar{M}_{15})$

$$C_{2,10} = \bar{S}_3 + \bar{S}_{23}$$

$$C_{2,11} = 2(\bar{S}_7 - e_3\bar{M}_{17} + \bar{S}_{33})$$

$$C_{2,12} = e_2\bar{M}_3 + e_2\bar{M}_{16} + \bar{S}_3 + \bar{S}_{23}$$

$$C_{2,13} = -\bar{S}_{30}$$

$$C_{2,14} = 0$$

$$C_{2,15} = \bar{S}_{33}$$

$$C_{2,16} = e_3\bar{M}_{34} - \bar{S}_{15} - \bar{S}_{54}$$

$$C_{2,17} = 0$$

$$C_{2,18} = e_3\bar{M}_{37} - \bar{S}_{18} + \bar{S}_{55} - \bar{S}_{57} - e_3\bar{M}_{35} + \bar{S}_{16}$$

$$C_{2,19} = e_3\bar{M}_{18} - \bar{S}_8 - \bar{S}_{34}$$

Lagging Degree of Freedom

$$C_{3,1} = (e_2 - e_1)(\bar{S}_4 - e_3\bar{M}_9 + \bar{S}_{25}) + \bar{I}_2 - e_3\bar{S}_{20} + \bar{I}_{23}$$

$$C_{3,2} = -2(e_3^2\bar{M}_{12} + \bar{I}_9 - 2e_3\bar{S}_{28} + \bar{I}_{32})$$

$$C_{3,3} = e_1(\bar{S}_4 - e_3\bar{M}_9 + \bar{S}_{25}) + (1/\Omega^2)\{\bar{K}_{\delta_{input}}\delta_\zeta\delta_\theta - \bar{K}_{\theta_{input}}\theta_\zeta\}$$

$$C_{3,4} = -(e_2 - e_1)(\bar{M}_2 + \bar{M}_{15}) - \bar{S}_2 - \bar{S}_{22}$$

$$C_{3,5} = 2(\bar{S}_8 - e_3\bar{M}_{18} + \bar{S}_{34})$$

$$C_{3,6} = -e_1(\bar{M}_2 + \bar{M}_{15})$$

$$C_{3,7} = (e_2 - e_1)^2(\bar{M}_1 + \bar{M}_8) + 2(e_2 - e_1)(\bar{S}_1 + \bar{S}_{19}) + e_3(e_3\bar{M}_{13} - 2\bar{S}_{29}) + \bar{I}_1 + \bar{I}_{10} + \bar{I}_{22} + \bar{I}_{33}$$

$$C_{3,8} = \overline{C}_{\zeta}/\Omega$$

$$C_{3,9} = e_1(e_2 - e_1)(\overline{M}_1 + \overline{M}_8) + e_1(\overline{S}_1 + \overline{S}_{19}) + (1/\Omega^2)\{\overline{K}_{\zeta} + \overline{K}_{\theta_{input}}\theta_{\zeta}^2 + \overline{K}_{\delta_{input}}\delta_{\zeta}^2\}$$

$$C_{3,10} = e_3(e_3\overline{M}_{12} - 2\overline{S}_{28}) + \overline{I}_9 + \overline{I}_{32}$$

$$C_{3,11} = 2[(e_2 - e_1)(\overline{S}_4 - e_3\overline{M}_9 + \overline{S}_{25}) + e_3\overline{S}_{20} - \overline{I}_2 - \overline{I}_{23}]$$

$$C_{3,12} = (1/\Omega^2)\{\overline{K}_{\theta_{input}}\theta_{\zeta}\theta_{\beta} + \overline{K}_{\delta_{input}}\delta_{\zeta}\delta_{\beta}\}$$

$$C_{3,13} = (e_2 - e_1)\ \overline{S}_{25} + \overline{I}_{23}$$

$$C_{3,14} = 2(e_3\overline{S}_{28} - \overline{I}_{32})$$

$$C_{3,15} = e_1\overline{S}_{25} - \overline{K}_{\delta_{input}}\delta_{\zeta}/\Omega^2$$

$$C_{3,16} = (e_2 - e_1)(\overline{S}_{13} - e_3\overline{M}_{25} + \overline{S}_{45}) + \overline{I}_4 - e_3\overline{S}_{42} + \overline{I}_{25}$$

$$C_{3,17} = -2(e_3^2\ \overline{M}_{28} + \overline{I}_{13} - 2e_3\overline{S}_{48} + \overline{I}_{36})$$

$$C_{3,18} = e_1(\overline{S}_{13} - e_3\overline{M}_{25} + \overline{S}_{45})$$

$$C_{3,19} = e_1(e_3\overline{M}_{10} - \overline{S}_5 - \overline{S}_{26}) + (1/\Omega^2)\{\overline{K}_{\theta_{input}}\theta_{\zeta}(\theta_c + \theta_1\$_{\psi} + \theta_2¢_{\psi} + \theta_3\$_{2\psi} + \theta_4¢_{2\psi}) + \overline{K}_{\delta_{input}}\delta_{\zeta}(\delta_c + \delta_1\$_{\psi} + \delta_2¢_{\psi} + \delta_3\$_{2\psi} + \delta_4¢_{2\psi}) - \overline{K}_{\zeta}\zeta_o\}$$

Flapping Degree of Freedom

$$C_{4,1} = e_3\bar{S}_{21} - \bar{I}_3 - I_{24}$$

$$C_{4,2} = -2(e_3^2\bar{M}_{11} + \bar{I}_8 - 2e_3\bar{S}_{27} + \bar{I}_{31})$$

$$C_{4,3} = e_3\bar{S}_{21} - \bar{I}_3 - \bar{I}_{24} + e_2(e_3\bar{M}_{10} - \bar{S}_5 - \bar{S}_{26}) + (1/\Omega^2)\{\bar{K}_{\delta_{input}}\delta_\theta\delta_\beta - \bar{K}_{\theta_{input}}\theta_\beta\}$$

$$C_{4,4} = \bar{S}_3 + \bar{S}_{23}$$

$$C_{4,5} = -2(\bar{S}_7 - e_3\bar{M}_{17} + \bar{S}_{33})$$

$$C_{4,6} = e_2\bar{M}_3 + e_2\bar{M}_{16} + \bar{S}_3 + \bar{S}_{23}$$

$$C_{4,7} = e_3^2\bar{M}_{12} + \bar{I}_9 - 2e_3\bar{S}_{28} + \bar{I}_{32}$$

$$C_{4,8} = -2[(e_2 - e_1)(\bar{S}_4 - e_3\bar{M}_9 + \bar{S}_{25}) + e_3\bar{S}_{20} - \bar{I}_2 - \bar{I}_{23}]$$

$$C_{4,9} = (1/\Omega^2)\{\bar{K}_{\theta_{input}}\theta_\beta\theta_\zeta + \bar{K}_{\delta_{input}}\delta_\beta\delta_\zeta\}$$

$$C_{4,10} = \bar{I}_1 + \bar{I}_{22} + e_3^2\bar{M}_{11} + \bar{I}_8 - 2e_3\bar{S}_{27} + \bar{I}_{31}$$

$$C_{4,11} = \bar{C}_\beta$$

$$C_{4,12} = e_2(\bar{S}_1 + \bar{S}_{19}) + \bar{I}_1 + \bar{I}_{22} - e_3^2\bar{M}_{11} - \bar{I}_8 + 2e_3\bar{S}_{27} - \bar{I}_{31} + (1/\Omega^2)\{\bar{K}_\beta + \bar{K}_{\theta_{input}}\theta_\beta^2 + \bar{K}_{\delta_{input}}\delta_\beta^2\}$$

$$C_{4,13} = -\,I_{24}$$

$$C_{4,14} = 2(e_3\bar{S}_{27} - \bar{I}_{31})$$

$$C_{4,15} = -e_2\bar{S}_{26} - \bar{I}_{24} - (1/\Omega^2)\,\bar{K}_{\delta_{input}}\,\delta_\beta$$

$$C_{4,16} = e_3\bar{S}_{43} - \bar{I}_5 - \bar{I}_{26}$$

$$C_{4,17} = -2(e_3^{\,2}\bar{M}_{27} + \bar{I}_{12} - 2e_3\bar{S}_{47} + \bar{I}_{35})$$

$$C_{4,18} = e_3\bar{S}_{43} - \bar{I}_5 - \bar{I}_{26} + e_2(e_3\bar{M}_{26} - \bar{S}_{14} - \bar{S}_{46})$$

$$\begin{aligned} C_{4,19} = {} & e_2e_3\bar{M}_9 - e_2\bar{S}_4 - e_2\bar{S}_{25} + e_3\bar{S}_{20} - \bar{I}_2 - \bar{I}_{23} \\ & - (1/\Omega^2)\{\bar{K}_\beta\beta_o - \bar{K}_{\theta_{input}}\theta_\beta(\theta_c + \theta_1\$_\psi + \theta_2\text{¢}_\psi\} \\ & + \theta_3\$_{2\psi} + \theta_4\text{¢}_{2\psi}) - \bar{K}_{\delta_{input}}\delta_\beta(\delta_c + \delta_1\$_\psi \\ & + \delta_2\text{¢}_\psi + \delta_3\$_{2\psi} + \delta_4\text{¢}_{2\psi}) \end{aligned}$$

Control-Flap Degree of Freedom

$$C_{5,1} = -e_3\bar{S}_{24} + \bar{I}_{28}$$

$$C_{5,2} = 0$$

$$C_{5,3} = e_3\bar{S}_{27} - \bar{I}_{31} - e_3\bar{S}_{29} + \bar{I}_{33} - \bar{K}_{\delta_{input}}\delta_\theta/\Omega^2$$

$$C_{5,4} = -\bar{S}_{30}$$

Twisting Degree of Freedom

$$C_{6,1} = e_3^2\bar{M}_{24} + \bar{I}_{11} - 2e_3\bar{S}_{44} + \bar{I}_{34}$$

$$C_{6,2} = 0$$

$$C_{6,3} = -e_3^2\bar{M}_{27} - \bar{I}_{12} + 2e_3\bar{S}_{47} + \bar{I}_{35} + e_3^2\bar{M}_{29} + \bar{I}_{14}$$
$$- 2e_3\bar{S}_{49} + \bar{I}_{37}$$

$$C_{6,4} = e_3\bar{M}_{34} - \bar{S}_{15} - \bar{S}_{54}$$

$$C_{6,5} = 0$$

$$C_{6,6} = e_3\bar{M}_{37} - \bar{S}_{18} - \bar{S}_{57} - e_3\bar{M}_{35} + \bar{S}_{55} + \bar{S}_{16}$$

$$C_{6,7} = (e_2 - e_1)(\bar{S}_{13} - e_3\bar{M}_{25} + \bar{S}_{45}) + \bar{I}_4 - e_3\bar{S}_{42} + \bar{I}_{25}$$

$$C_{6,8} = 2(e_3^2\bar{M}_{28} + \bar{I}_{13} - 2e_3\bar{S}_{48} + \bar{I}_{36})$$

$$C_{6,9} = (e_1\bar{S}_{13} - e_1e_3\bar{M}_{25} + e_1\bar{S}_{45})$$

$$C_{6,10} = (e_3\bar{S}_{43} - \bar{I}_5 - \bar{I}_{26})$$

$$C_{6,11} = 2(e_3^2\bar{M}_{27} + \bar{I}_{12} - 2e_3\bar{S}_{47} + \bar{I}_{35})$$

$$C_{6,12} = e_3\bar{S}_{43} - \bar{I}_5 - \bar{I}_{26} + e_2(e_3\bar{M}_{25} - \bar{S}_{14} - \bar{S}_{46})$$

$$C_{6,13} = \bar{I}_{34} - e_3\bar{S}_{44}$$

$$C_{6,14} = 0$$

$$C_{6,15} = e_3\overline{S}_{47} - \overline{I}_{35} - e_3\overline{S}_{49} + \overline{I}_{37} - (1/\Omega^2)\overline{K}_{\delta_{input}}\delta_\theta$$

$$C_{6,16} = e_3^2\overline{M}_{30} + \overline{I}_{15} - 2e_3\overline{S}_{50} + \overline{I}_{38}$$

$$C_{6,17} = 0 + \{e_3^2\overline{M}_{33} + \overline{I}_{18} - 2e_3\overline{S}_{52} + \overline{I}_{41}\}C_{tw}$$

$$C_{6,18} = -e_3^2\overline{M}_{31} - \overline{I}_{16} + 2e_3\overline{S}_{51} + \overline{I}_{39} + \{e_3^2\overline{M}_{33} + \overline{I}_{18} - 2e_3\overline{S}_{52} + \overline{I}_{41}\}\omega_{tw}^2/\Omega^2$$

$$C_{6,19} = e_3^2\overline{M}_{28} + \overline{I}_{13} - 2e_3\overline{S}_{48} + \overline{I}_{36}$$

Pitch Degree of Freedom

$$T_{1,1} = 0$$

$$T_{1,2} = -\gamma/2\int (c^3\bar{U}_{t_o}/c_oR^2a_o)(\partial c_{m_\theta}/\partial\dot{\alpha})\, dx$$

$$T_{1,3} = -\gamma/2\int c\bar{U}_{t_o}^{2}(\xi_a a/c_oRa_o)dx$$

$$T_{1,4} = 0$$

$$T_{1,5} = \gamma/2\int (c^2\phi_o/c_oa_oR^2)\{(\xi_a a/c)(2\bar{U}_{t_o}\theta_x[\theta_x - \alpha_{o_m}]$$

$$+ \lambda\theta_x + \bar{U}_{t_o}) + 2\bar{U}_{t_o}\theta_x c_{m_o}\}dx$$

$$T_{1,6} = 0$$

$$T_{1,7} = 0$$

$$T_{1,8} = -\gamma/2\int (c^2/c_oRa_o)\{(\xi_a a/c)[2\bar{U}_{t_o}(\theta_x - \alpha_{o_m}) + \lambda]$$

$$+ 2\bar{U}_{t_o}c_{m_o}\}(x - e_1)\, dx$$

$$T_{1,9} = -\gamma/2\int (c^2/c_oRa_o)\{(\xi_a a/c)[2\bar{U}_{t_o}(\theta_x - \alpha_{o_m}) + \lambda]$$

$$+ 2\bar{U}_{t_o}c_{m_o}\}\ \mu\phi_x dx$$

$$T_{1,10} = 0$$

$$T_{1,11} = \gamma/2\int (c^2/c_o R a_o)\{(\xi_a a/c)(x - e_2)\ \bar{U}_{t_o}\}\ dx$$

$$T_{1,12} = \gamma/2\int (c^2/c_o R a_o)\{(\xi_a a/c)\ \bar{U}_{t_o}\mu \phi_\psi\}\ dx$$

$$T_{1,13} = 0$$

$$T_{1,14} = -\gamma/2\int (c^3/c_o R^2 a_o)\{\bar{U}_{t_o}(\partial c_m/\partial\dot{\delta})\}\ dx$$

$$T_{1,15} = -\gamma/2\int (c^2/c_o R a_o)\{\bar{U}_{t_o}\ (\partial c_{m_\theta}/\partial\delta)\}\ dx$$

$$T_{1,16} = 0$$

$$T_{1,17} = -\gamma/2\int (c^3\phi_{tw}/c_o R^2 a_o)\ \bar{U}_{t_o}(\partial c_{m_\theta}/\partial\dot{\alpha})\ dx$$

$$T_{1,18} = -\gamma/2\int (c^2\phi_{tw}/R c_o a_o)\ \bar{U}_{t_o}^{\,2}(\xi_a a/c)\ dx$$

$$T_{1,19} = -\gamma/2\int (c^2/c_o R a_o)\ \bar{U}_{t_o}\{(\xi_a a/c)[U_{t_o}(\theta_x - \alpha_{o_m})$$
$$+ \lambda] + c_{m_o}\bar{U}_{t_o}\}\ dx$$

Bending Degree of Freedom

$$T_{2,1} = 0$$

$$T_{2,2} = -\gamma/2\int(c^2\phi_o/R^2 c_o a_o)\{(\partial c_\ell/\partial\dot{\alpha})\ \bar{U}_{t_o}\}\ dx$$

$$T_{2,3} = -\gamma/2\int(c\phi_o/c_o a_o R)\{(a + c_{d_o})\ \bar{U}_{t_o}^2\}\ dx$$

$$T_{2,4} = 0$$

$$T_{2,5} = \gamma/2\int(c\phi^2_o/c_o a_o R^2)\{(a + c_{d_o})(2\bar{U}_{t_o}\theta_x^2 + \lambda\theta_x + \bar{U}_{t_o})\}\ dx$$

$$T_{2,6} = 0$$

$$T_{2,7} = 0$$

$$T_{2,8} = -\gamma/2\int(c\phi_o/c_o a_o R)\{(x - e_1)(a + c_{d_o})(2\bar{U}_{t_o}\theta_x + \lambda)\}\ dx$$

$$T_{2,9} = -\gamma/2\int(c\phi_o/c_o a_o R)\{(\mu\text{¢}_\psi(a + c_{d_o})(2\bar{U}_{t_o}\theta_x + \lambda)\}\ dx$$

$$T_{2,10} = 0$$

$$T_{2,11} = \gamma/2\int(c\phi_o/c_o a_o R)\{(x - e_2)(a + c_{d_o})\ \bar{U}_{t_o}\}\ dx$$

$$T_{2,12} = \gamma/2\int(c\phi_o/c_o a_o R)\{\ \mu\text{¢}_\psi(a + c_{d_o})\ \bar{U}_{t_o}\}\ dx$$

$T_{2,13} = 0$

$T_{2,14} = -\gamma/2\int(c^2\phi_o/c_o a_o R^2)\{(\partial c_\ell/\partial\dot{\delta})\ \bar{U}_{t_o}\}\ dx$

$T_{2,15} = -\gamma/2\int(c\phi_o/c_o a_o R)\{(\partial c_\ell/\partial\delta)\ \bar{U}_{t_o}{}^2\}\ dx$

$T_{2,16} = 0$

$T_{2,17} = -\gamma/2\int(c^2 d\phi_{tw}/R^2 c_o a_o)\{(\partial c_\ell/\partial\alpha)\ \bar{U}_{t_o}\}\ dx$

$T_{2,18} = -\gamma/2\int(c\phi_{tw}\phi_o/c_o a_o R)\{(a + c_{D_o})\ \bar{U}_{t_o}{}^2\}\ dx$

$T_{2,19} = -\gamma/2\int(c\phi_o/c_o a_o R)\{(a + c_{D_o})\ \bar{U}_{t_o}(\bar{U}_{t_o}\theta_x + \lambda)\}\ dx$

Lag Degree of Freedom

$T_{3,1} = 0$

$T_{3,2} = -\gamma/2\int(c^2(x - e_1)/a_o c_o R)\{(\partial c_\ell/\partial\alpha)\ \lambda\}\ dx$

$T_{3,3} = -\gamma/2\int(c(x - e_1)/a_o c_o)\ \bar{U}_{t_o}\{a\lambda\}\ dx$

$T_{3,4} = 0$

$$T_{3,5} = \gamma/2\int (c(x - e_1)\dot{\phi}_o/a_o c_o R)\{2a\lambda + a\theta_x(\bar{U}_{t_o} + \lambda\theta_x) - 2c_{d_o}\bar{U}_{t_o}\theta_x\}\,dx$$

$$T_{3,6} = 0$$

$$T_{3,7} = 0$$

$$T_{3,8} = -\gamma/2\int (c(x - e_1)^2/a_o c_o)\{a\lambda\theta_x - 2c_{d_o}\bar{U}_{t_o}\}\,dx$$

$$T_{3,9} = -\gamma/2\int (c(x - e_1)/a_o c_o)\{\mu \text{¢}_\psi(a\lambda\theta_x - 2c_{d_o}\bar{U}_{t_o})\}\,dx$$

$$T_{3,10} = 0$$

$$T_{3,11} = \gamma/2\int (c(x - e_1)(x - e_2)a/a_o c_o)\{\theta_x U_{t_o} + 2\lambda\}dx$$

$$T_{3,12} = \gamma/2\int (c(x - e_1)/a_o c_o)\ a\{\mu \text{¢}_\psi(\theta_x\bar{U}_{t_o} + 2\lambda)\}\,dx$$

$$T_{3,13} = 0$$

$$T_{3,14} = -\gamma/2\int (c^2(x - e_1)/a_o c_o R)\{(\partial c_\ell/\partial\dot{\delta})\ \lambda\}\,dx$$

$$T_{3,15} = -\gamma/2\ (c(x - e_1)/a_o c_o)\{\lambda\bar{U}_{t_o}(\partial c_\ell/\partial\delta)\}\,dx$$

$T_{3,16} = 0$

$T_{3,17} = -\gamma/2\int(c^2(x - e_1)\phi_{tw}/a_oc_oR)\{(\partial c_\ell/\partial\dot{\alpha})\ \lambda\}\ dx$

$T_{3,18} = -\gamma/2\int(\bar{U}_{t_o}c(x - e_1)\phi_{tw}/a_oc_o)\{a\lambda\}\ dx$

$T_{3,19} = -\gamma/2\int(c(x - e_1)/a_oc_o)\{a\theta_x\lambda\bar{U}_{t_o} - c_{d_o}\bar{U}_{t_o}^2\}\ dx$

Flapping Degree of Freedom

$T_{4,1} = 0$

$T_{4,2} = -\gamma/2\int(c^2(x - e_2)/a_oc_oR)\{\bar{U}_{t_o}(\partial c_\ell/\partial\dot{\alpha})\}\ dx$

$T_{4,3} = -\gamma/2\int(c(x - e_2)/a_oc_o)\{a\bar{U}_{t_o}^2\}\ dx$

$T_{4,4} = 0$

$$T_{4,5} = \gamma/2\int([x - e_2]c\phi_o/a_oc_oR)\{a(2\bar{U}_{t_o}\theta_x^2 + \lambda\theta_x + \bar{U}_{t_o}) + c_{d_o}(\bar{U}_{t_o} + \lambda\theta_x)\}\ dx$$

$T_{4,6} = 0$

$T_{4,7} = 0$

$$T_{4,8} = -\gamma/2\int (c(x - e_1)(x - e_2)/a_o c_o)\{a(2\bar{U}_{t_o}\theta_x + \lambda)$$

$$+ c_{d_o}\lambda\}\,dx$$

$$T_{4,9} = -\gamma/2\int (c(x - e_1)/a_o c_o)\{\mu\phi_\psi(a[2\bar{U}_{t_o}\theta_x + \lambda]$$

$$+ c_{d_o}\lambda)\}\,dx$$

$$T_{4,10} = 0$$

$$T_{4,11} = \gamma/2\int (c(x - e_2)^2/a_o c_o)\{a\bar{U}_{t_o} + c_{d_o}\bar{U}_{t_o}\}\,dx$$

$$T_{4,12} = \gamma/2\int (c(x - e_2)/a_o c_o)\{\mu\phi_\psi\bar{U}_{t_o}(a + c_{d_o})\}\,dx$$

$$T_{4,13} = 0$$

$$T_{4,14} = -\gamma/2\int (c^2(x - e_2)/a_o c_o R)\{(\partial c_\ell/\partial\dot{\delta})\ \bar{U}_{t_o}\}\,dx$$

$$T_{4,15} = -\gamma/2\int (c(x - e_2)/a_o c_o)\{(\partial c_\ell/\partial\delta)\ \bar{U}_{t_o}^2\}\,dx$$

$$T_{4,16} = 0$$

$$T_{4,17} = -\gamma/2\int (c^2(x - e_2)\phi_{tw}/a_o c_o R)\{\bar{U}_{t_o}(\partial c_\ell/\partial\dot{\alpha})\}\,dx$$

$$T_{4,18} = -\gamma/2\int (c(x - e_2)\phi_{tw}/a_o c_o)\{a\bar{U}_{t_o}^{2}\}\, dx$$

$$T_{4,19} = -\gamma/2\int (c(x - e_2)/a_o c_o)\{\bar{U}_{t_o}[a(\bar{U}_{t_o}\theta_x + \lambda) + c_{d_o}\lambda]\}\, dx$$

Control-Flap Degree of Freedom

$$T_{5,1} = 0$$

$$T_{5,2} = -\gamma/2\int (c^3/a_o c_o R^2)\{(\partial c_{m\delta}/\partial\dot{\alpha})\ \bar{U}_{t_o}\}\, dx$$

$$T_{5,3} = -\gamma/2\int (c^2/a_o c_o R)\{(\partial c_{m\delta}/\delta\alpha)\ \bar{U}_{t_o}^{2}\}\, dx$$

$$T_{5,4} = 0$$

$$T_{5,5} = \gamma/2\int (c^2\phi/a_o c_o R\ R)\{(\partial c_{m\delta}/\partial\alpha)\ [2\bar{U}_{t_o}\theta_x^{2} + \lambda\theta_x + U_{t_o}]\}\, dx$$

$$T_{5,6} = 0$$

$$T_{5,7} = 0$$

$$T_{5,8} = -\gamma/2\int (c^2/a_o c_o R)\{(x - e_1)\ (\partial c_{m\delta}/\partial\alpha)(2\bar{U}_{t_o}\theta_x + \lambda)\}\, dx$$

$$T_{5,9} = -\gamma/2\int (c^2/a_o c_o R)\{\mu\not{c}_{\psi}(\partial c_{m\delta}/\partial\alpha)\ (2\bar{U}_{t_o}\theta_x + \lambda)\}\, dx$$

$$T_{5,10} = 0$$

$$T_{5,11} = \gamma/2\int (c^2/a_o c_o R)\{(x - e_2)(\partial c_{m\delta}/\partial\alpha)\ \bar{U}_{t_o}\}\ dx$$

$$T_{5,12} = \gamma/2\int (c^2/a_o c_o R)\{\mu\phi_\psi(\partial c_{m\delta}/\partial\alpha)\ \bar{U}_{t_o}\}\ dx$$

$$T_{5,13} = 0$$

$$T_{5,14} = -\gamma/2\int (c^3/a_o c_o R^2)\{(\partial c_{m\delta}/\partial\dot{\delta})\ \bar{U}_{t_o}\}\ dx$$

$$T_{5,15} = -\gamma/2\int (c^2/a_o c_o R)\{(\partial c_{m\delta}/\partial\delta)\ \bar{U}_{t_o}^2\}\ dx$$

$$T_{5,16} = 0$$

$$T_{5,17} = -\gamma/2\int (c^3\phi_{tw}/a_o c_o R^2)\{(\partial c_{m\delta}/\partial\dot{\alpha})\ \bar{U}_{t_o}\}\ dx$$

$$T_{5,18} = -\gamma/2\int (c^2\phi_{tw}/a_o c_o R)\{(\partial c_{m\delta}/\partial\alpha)\ \bar{U}_{t_o}^2\}\ dx$$

$$T_{5,19} = -\gamma/2\int (c^2/a_o c_o R)\{\bar{U}_{t_o}(\partial c_{m\delta}/\partial\alpha)\ (\bar{U}_{t_o}\theta_x + \lambda)\}\ dx$$

Twisting Degree of Freedom

$$T_{6,1} = 0$$

$$T_{6,2} = -\gamma/2\int (\phi_{tw}c^3/c_o R^2 a_o)\ \bar{U}_{t_o}(\partial c_{m_\theta}/\partial\dot{\alpha})\ dx$$

$$T_{6,3} = -\gamma/2\int (\phi_{tw}c^2/Rc_o a_o)\ \bar{U}_{t_o}^{\,2}(\xi_a a/c)\ dx$$

$$T_{6,4} = 0$$

$$T_{6,5} = \gamma/2\int (c^2\phi_{tw}\phi_\delta/c_o a_o R^2)\{(\xi_a a/c)(2\bar{U}_{t_o}\theta_x[\theta_x - \alpha_{om}] + \lambda\theta_x + \bar{U}_{t_o}) + 2\bar{U}_{t_o}\theta_x c_{m_o}\}\ dx$$

$$T_{6,6} = 0$$

$$T_{6,7} = 0$$

$$T_{6,8} = -\gamma/2\int (c^2\phi_{tw}/c_o Ra_o)\{(\xi_a a/c)[2\bar{U}_{t_o}(\theta_x - \alpha_{om}) + \lambda + 2\bar{U}_{t_o}c_{m_o}\}(x - e_1)\ dx$$

$$T_{6,9} = -\gamma/2\int (c^2\phi_{tw}/c_o Ra_o)\{(\xi_a a/c)[2\bar{U}_{t_o}(\theta_x - \alpha_{om}) + \lambda + 2\bar{U}_{t_o}c_{m_o}\}\mu\cancel{c}_\psi dx$$

$$T_{6,10} = 0$$

$$T_{6,11} = \gamma/2\int (c^2\phi_{tw}/c_o Ra_o)\{(\xi_a a/c)(x - e_2)\ \bar{U}_{t_o}\}\ dx$$

$$T_{6,12} = \gamma/2\int (c^2\phi_{tw}/c_o Ra_o)\{(\xi_a a/c)\ \bar{U}_{t_o}\mu\cancel{c}_\psi\}\ dx$$

$$T_{6,13} = 0$$

$$T_{6,14} = -\gamma/2\int (c^3\,\phi_{tw}/c_o R^2 a_o)\{\bar{U}_{t_o}\ (\partial c_{m\theta}/\partial\dot{\delta})\}\ dx$$

$$T_{6,15} = -\gamma/2\int (c^2\,\phi_{tw}/c_o R a_o)\ \{\bar{U}_{t_o}^{\,2}(\partial c_{m\theta}/\partial\delta)\}\ dx$$

$$T_{6,16} = 0$$

$$T_{6,17} = -\gamma/2\int (c^3\,\phi_{tw}^{\,2}/c_o R^2 a_o)\ \bar{U}_{t_o}(\partial c_{m\theta}/\partial\dot{\alpha})\ dx$$

$$T_{6,18} = -\gamma/2\int (c^2\,\phi_{tw}^{\,2}/R c_o a_o)\ \bar{U}_{t_o}^{\,2}(\xi_a a/c)\ dx$$

$$T_{6,19} = -\gamma/2\int (c^2\,\phi_{tw}/c_o R a_o)\ \bar{U}_{t_o}\{(\xi_a a/c)[\bar{U}_{t_o}(\theta_x - \alpha_{om}) + \lambda]$$

$$+ c_{m_o}\bar{U}_{t_o}\}\ dx$$

TABLE VII. SUMMARY OF ROTOR BLADE CONFIGURATIONS FOR USE IN THE OPTIMIZATION STUDIES

Rotor Planform

Planform No.	Rotor Type	Chord (in.)	Flap Size (in.)	Radial Location of Flap	Figure No.
I	DCR	21.56	48	-	20
II	CTR	21.56	48	Tip	21
III	CTR	21.56	42	75%R	22
IV	CTR	21.56	38	Tip	23
V	CTR	21.56	58	Tip	24

DCR Configurations

DCR Designation	Planform	Built-In Twist	Nonrotating Torsional Frequency ω_{tw} (cps)
a1	I	0.0	33.7
a2	I	-4.0	33.7
a3	I	-8.0	33.7
a4	I	-10.0	33.7

CTR Configurations

CTR Designation	Planform	Built-In Twist θ_x (deg)	Flap Arrangement	Nonrotating Torsional Frequency ω_{tw} (cps)
A1	II	0.0	External	8.28
A2	II	-4.0	External	8.28
A3	II	-8.0	External	8.28
B1	II	-2.0	External	8.28
B2	II	-2.0	Faired	8.28
C1	II	-2.0	Faired	6.76
C2	II	-2.0	Faired	9.43
E	III	-2.0	Faired	8.28
F	IV	-2.0	Faired	8.28
G	V	-2.0	Faired	8.28

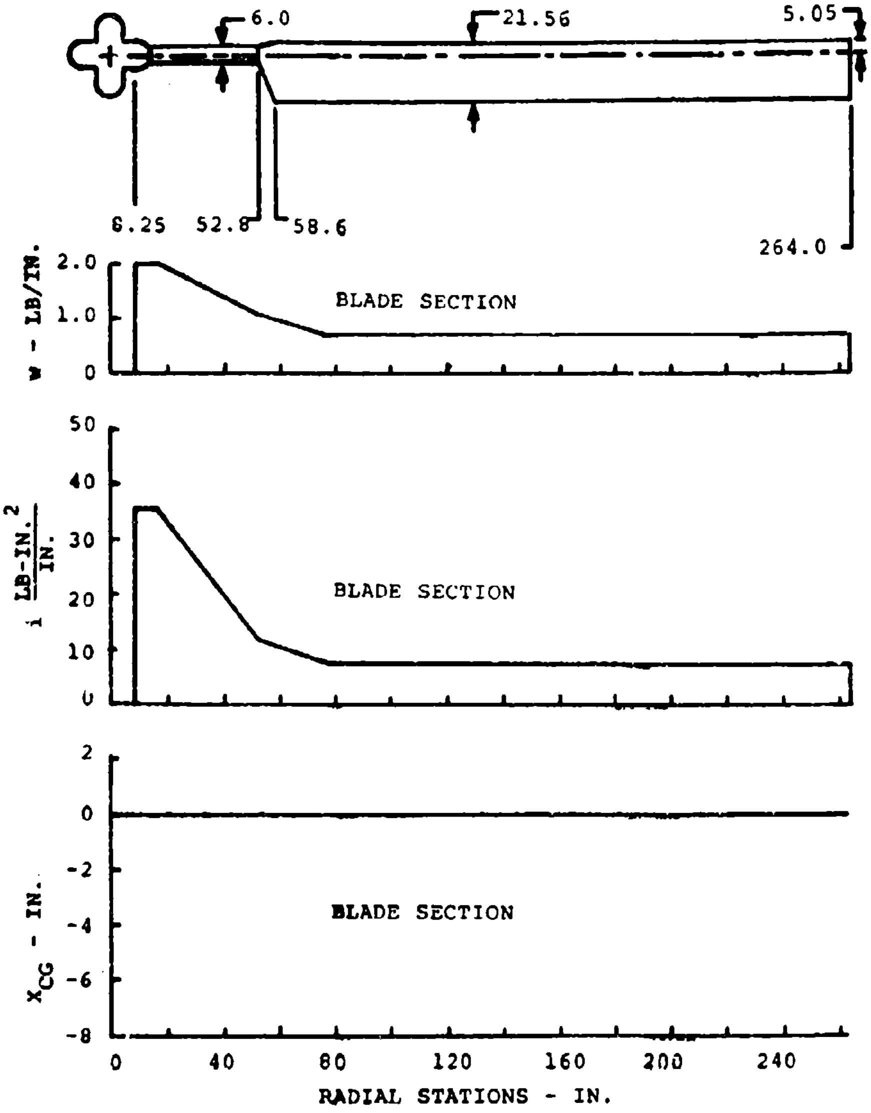

Figure 20. Physical Distributions of Planform, Mass, Feathering Inertia, and CG for the Direct Control Rotor Configuration; Planform I.

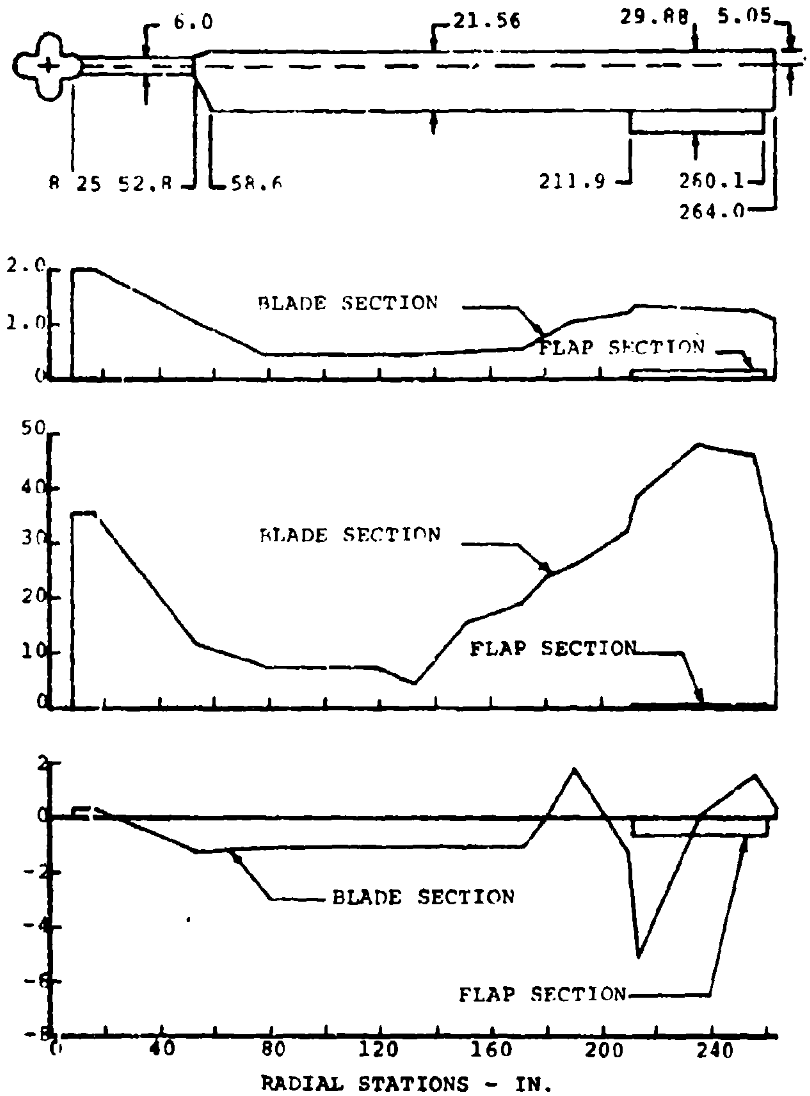

Figure 21. Physical Distributions of Planform, Mass, Feathering Inertia, and CG for the Controllable Twist Configuration With Planform II Having a 48-In. Flap Located Near the Blade Tip.

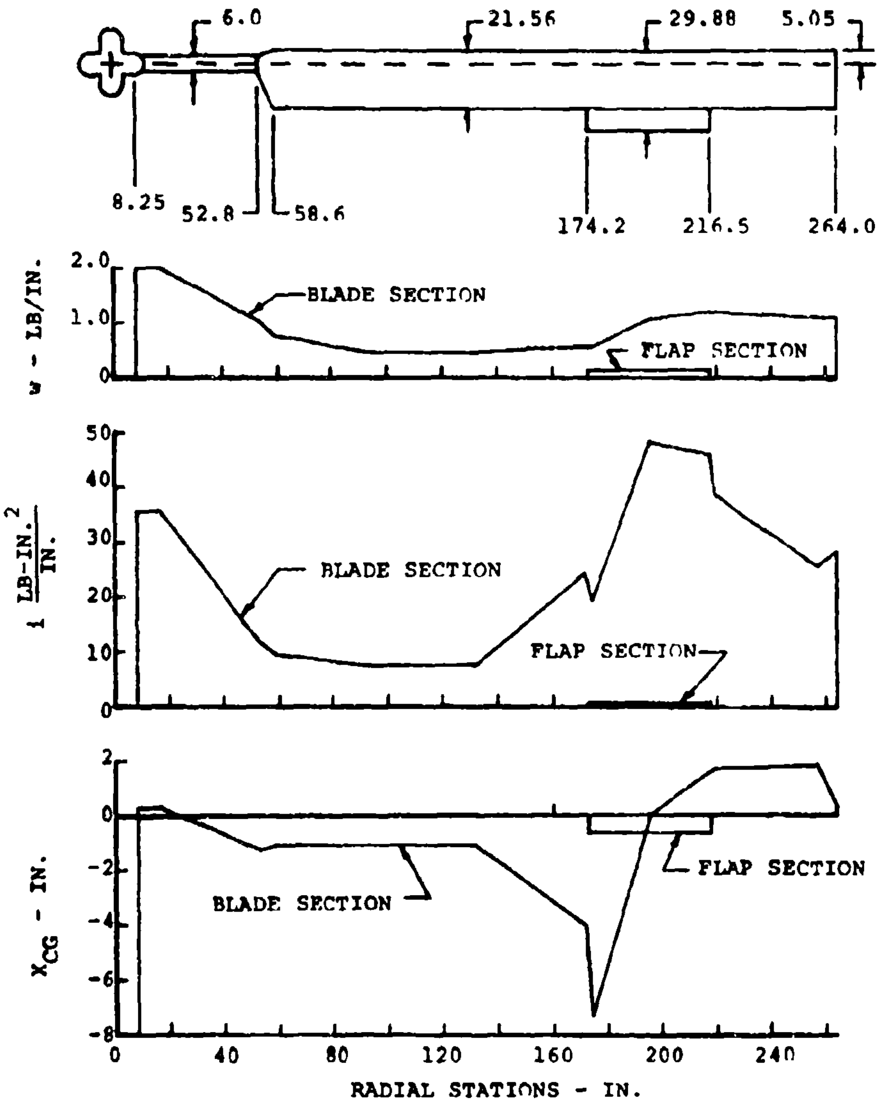

Figure 22. Physical Distributions of Planform, Mass, Feathering Inertia, and CG for the Controllable Twist Rotor Configuration With Planform III Having a 42-In. Flap Located Near the 75% Radius.

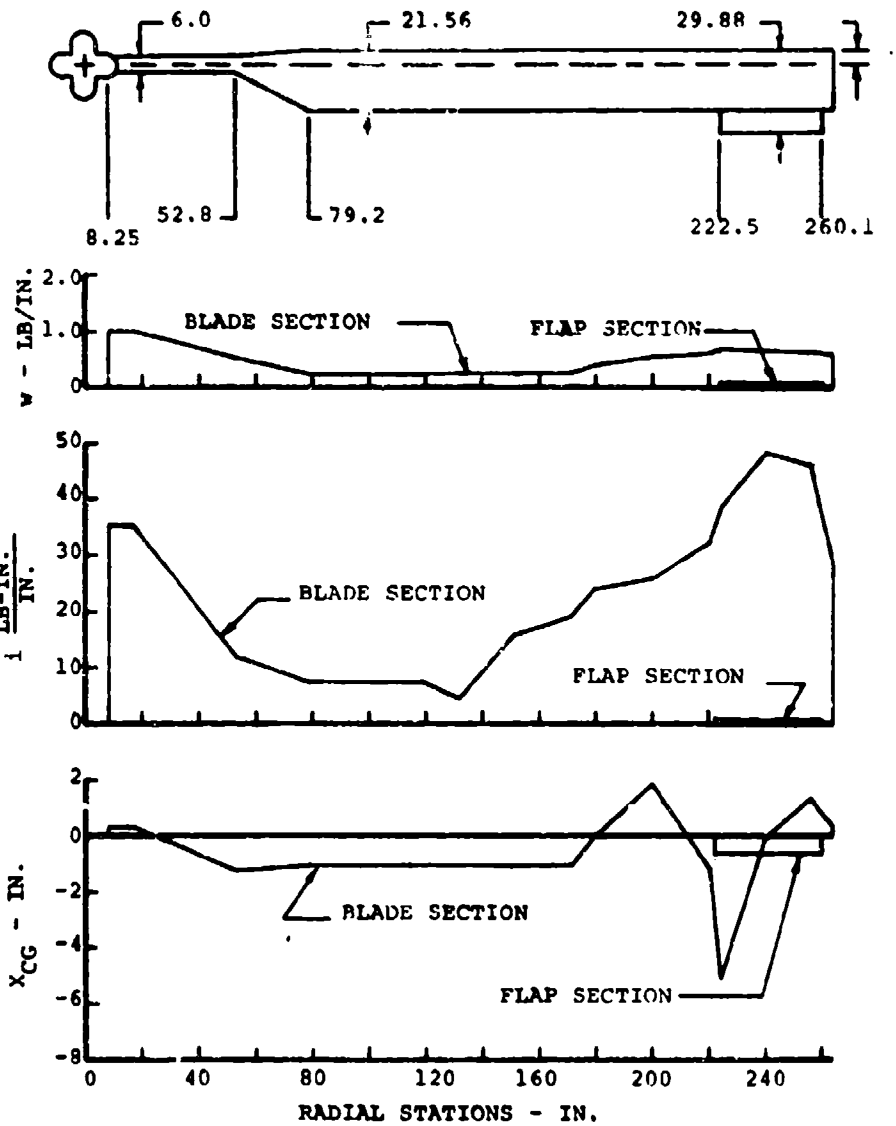

Figure 23. Physical Distributions of Planform, Mass, Feathering Inertia, and CG for the Controllable Twist Rotor Configuration With Planform IV Having a 38-In. Flap Located Near the Blade Tip.

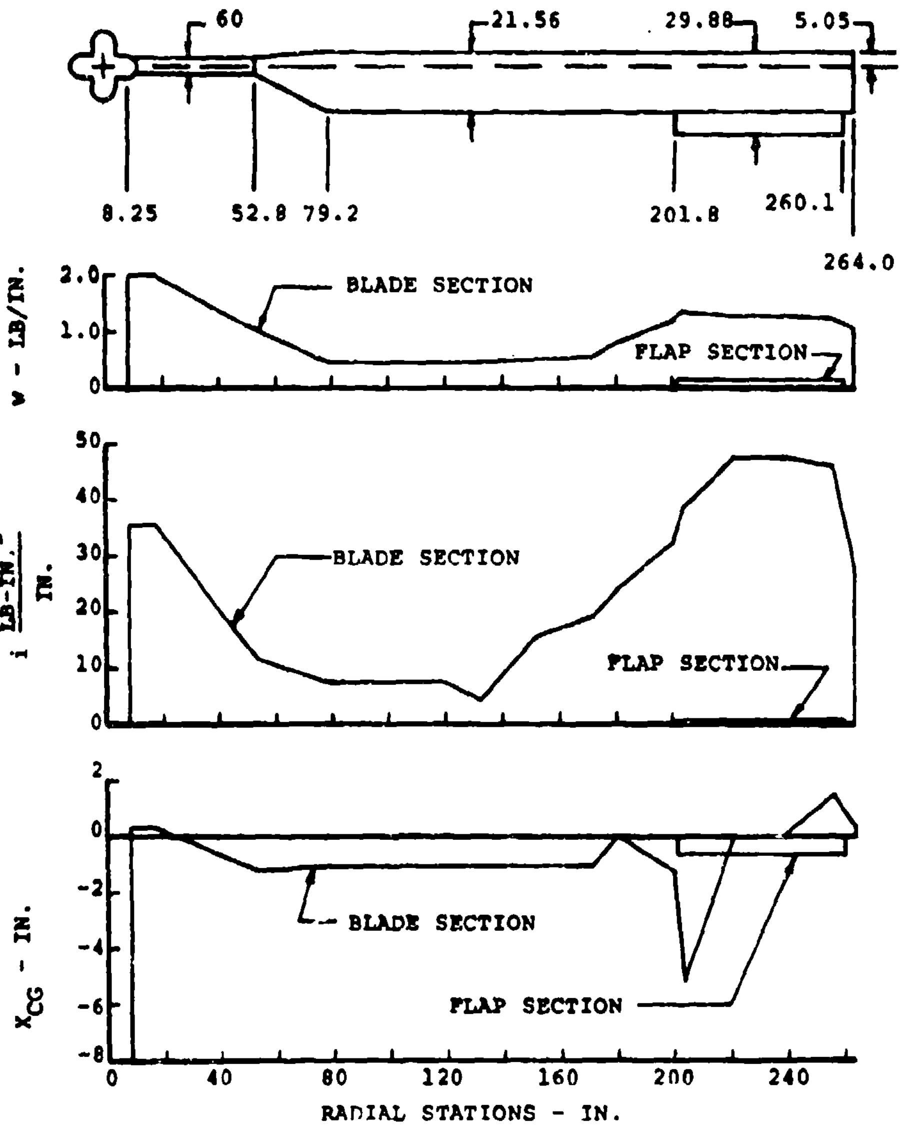

Figure 24. Physical Distribution of Planform, Mass Feathering Inertia, and CG for the Controllable Twist Rotor Configuration With Planform V Having a 58-In. Flap Located Near the Blade Tip.

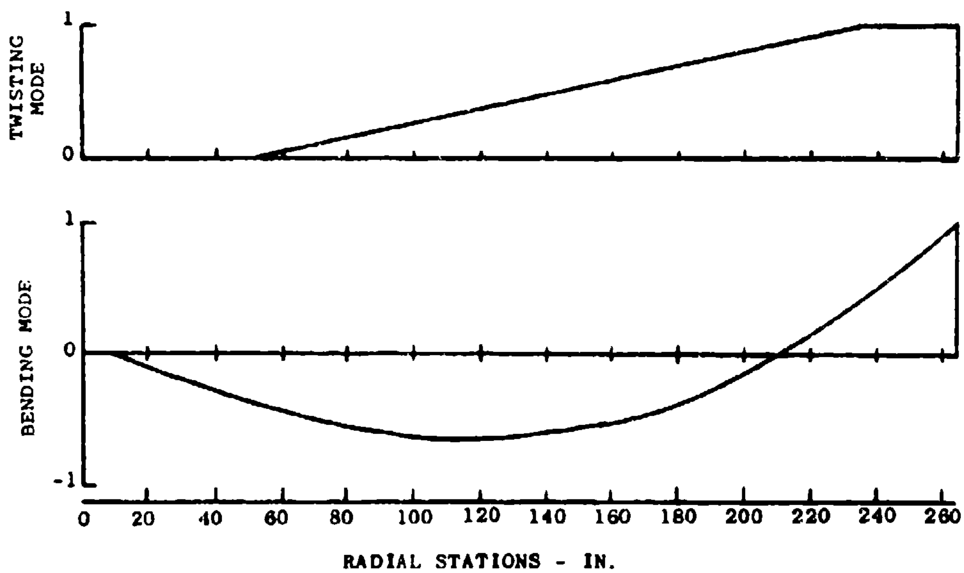

Figure 25. Bending and Twisting Mode Shapes for U.e in the CTR Analysis.

TABLE VIII. FIXED ROTOR CONSTANTS
Constants for Both the CTR and DCR
$R = 264$ In.
$e_1 = 8.25$ In.
$e_2 = 8.25$ In.
$K_\theta = 52.357$ In./Deg
$K_{\theta_{in}} = 10{,}000$ In./Deg
$C_\zeta = 924.88$ Lb-In./Deg/Sec
$C_{\theta_{tw}} = .05$ Lb-In./Deg/Sec
Constants for the CTR Only
$e_3 = -18.446$ In.
$C_f = 8.32$ In.
$K_\delta = 100$ Lb-In./Deg
$C_\delta = 0.4$ Lb-In./Deg/Sec

TABLE IX. AERODYNAMIC CONSTANTS FOR USE IN THE LINEAR EQUATIONS OF MOTION*

Aerodynamic Constants for Forward Flow

Mach No.	CMO	AO	ALOL	CDO	CLAD	CLD	CLDD
0.30	0.0	0.080	-1.00	0.009	0.0839	0.0356	0.0399
0.45	0.0	0.080	-1.00	0.009	0.0839	0.0356	0.0399
0.65	0.0	0.080	-1.00	0.009	0.1049	0.0440	0.0499
0.80	0.0	0.080	-1.00	0.011	0.1398	0.0412	0.0665

Mach No.	CMTAD	CMTD	CMTDD	CMDA	CMDD	CMDDD	CMDAD
0.30	-0.0183	-0.008	-0.00255	-0.00032	-0.00036	-0.000160	-0.000501
0.45	-0.0183	-0.008	-0.00255	-0.00032	-0.00036	-0.000160	-0.000501
0.65	-0.0229	-0.008	-0.00319	-0.00032	-0.00036	-0.000200	-0.000626
0.80	-0.0305	-0.008	-0.00425	-0.00032	-0.00036	-0.000267	-0.000835

Aerodynamic Constants for Use in the Reverse Flow Region

RCMO	=	0.0	RCMTAD	=	-0.0183
RAO	=	0.082	RCMTD	=	0.0
RALOL	=	181.20 Deg	RCMTDD	=	-0.00255
RCDO	=	0.012	RCMDA	=	0.0
RCL	=	0.0	RCMDD	=	0.0
RCLD	=	0.0	RCMDDD	=	-0.00016
RCLDD	=	0.04	RCMDAD	=	-0.00051

* All section data are based on total chord, including the servo-flap where applicable. All constants involving the servo-flap are set to 0.0 when the DCR is being evaluated.

TABLE IX - Continued

Aerodynamic Constants for Use in the Stall Regions

SCMO	=	-0.2	SCMTAD	=	-.0183
SAO	=	-0.008	SCMTD	=	0.0
SALCL	=	180.00 Deg	SCMTDD	=	-.00255
SCDO	=	0.05	SCMDA	=	0.0
SCLAD	=	0.084	SCMDD	=	-.00068
SCLD	=	0.0	SCMDDD	=	-.00016
SCLDD	=	0.0399	SCMDAD	=	-0.000501
CMO	=	C_{m_o}	CMTAD	=	$\partial C_{m_\theta} / \partial \dot{\alpha}$
Ao	=	a_o	CMTD	=	$\partial C_{m_\theta} / \partial \delta$
ALOL	=	α_o	CMTDD	=	$\partial C_{m_\theta} / \partial \dot{\delta}$
CDO	=	C_{d_o}	CMDA	=	$\partial C_{m_\delta} / \partial \alpha$
CLAD	=	$\partial C_1 / \partial \dot{\alpha}$	CMDD	=	$\partial C_{m_\delta} / \partial \delta$
CLD	=	$\partial C_1 / \partial \delta$	CMDDD	=	$\partial C_{m_\delta} / \partial \dot{\delta}$
CLDD	=	$\partial C_1 / \partial \dot{\delta}$	CMDAD	=	$\partial C_{m_\delta} / \partial \dot{\alpha}$

Note: The prefix "R" (on the above designations) indicates data used in the reverse flow region, and the prefix "S" indicates data used in the stall regions.

slopes and unsteady aerodynamic coefficients that are used in the normal flow region, in the reverse-flow region, and in an assumed stall flow region. The Mach number effects are considered only for the normal flow region on the rotor blades. The aerodynamic characteristics and data used in the nonlinear portion of the analysis are tabulated in Appendix IV.

All flight conditions throughout this analysis were considered at sea level and for a standard day. Speeds range from hover to 180 knots, and are listed in Table X, where the values for the trim variables used for level flight and the values of inflow used for various load factors are described.

ELASTIC TWIST AND CONTROL REQUIREMENTS

In the conventional rotor system, the relationships between the performance and the control requirements are complicated by the high degree of nonlinearity contained in the interaction effects. Neglecting the rotor control, we have three effects of the pitch horn, namely, longitudinal, lateral, and collective controls. These three controls all interact and affect the resolution of the rotor trim forces. On the other hand, the CTR having a dual control system has a more complex relationship with the performance parameters. We now have six control parameters: two longitudinal, two lateral, and two collective. These all interact in a highly nonlinear fashion making it difficult to find a relationship between performance parameters and controls. Thus, in order to understand some of the problems of optimization, it is necessary to learn some of the problems of the controls and twist and their effects on performance.

Control requirements were discussed in References 5 and 6, where the importance of control programming over the flight spectrum of the CTR was stressed. The CTR has two control systems, each one by itself capable of flying the ship in trim. It is necessary, therefore, to program the two control systems together, using some combination to give the desired elastic twist at all flight speeds. The desired twist is then the twist that gives either minimum horsepower, minimum vibration, little blade stall, or any combination thereof.

In order to achieve desired twist, a relationship between the controls and twist must be defined. The pitch horn and flap controls are input into the airloads analysis in series form as a first harmonic variation. The flap has a positive series,

$$\delta_{in} = \delta_o + \delta_{1s} \sin \psi + \delta_{1c} \cos \psi \qquad (46)$$

TABLE X. FLIGHT CONDITIONS AT SEA LEVEL AND STANDARD DAY					
Trim Factors for Level Flight					
	μ = 0.0	μ = .20	μ = .30	μ = .40	μ = .45
V	0.0 kts	80 kts	120 kts	160 kts	180 kts
α_f	0.0	-0.5 deg	-3.4 deg	-8.5 deg	-11.5 deg
F_Z	11,500 lb	11,500 lb	11,500 lb	11,500 lb	11,500 lb
F_X	0.0 lb	524 lb	1200 lb	2210 lb	2882 lb
F_Y	-71 lb	288 lb	29 lb	-746 lb	-1318 lb
Values of Inflow, λ, for Various Load Factors					
n_Z	μ = 0.0	μ = .20	μ = .30	μ = .40	μ = .45
1.0	-.0603	-.0371	-.0615	-.1120	-.1460
1.2	-	-	-	-.1135	-
1.35	-	-	-.0663	-.1152	-
1.48	-	-	-.068	-.116	-
1.83	-	-.045	-.071	-	-

while the pitch horn has a negative series in order to comply with conventional standards,

$$\theta_{in} = A_o - B_{1s} \sin \psi - A_{1s} \cos \psi \quad (47)$$

Blade twist is a response and is obtained from the airloads program as an output for the trim cases. The twist response is harmonically analyzed, and only the first harmonic is included for study in the present analysis. Twist is defined as a positive series given by Equation (48):

$$\theta_{tw} = \phi_o + \phi_{1s} \sin \psi + \phi_{1c} \cos \psi \quad (48)$$

where ϕ_o is the collective elastic twist and ϕ_{1s} and ϕ_{1c}, the longitudinal and lateral components of the one-per-rev cyclic twist. In this relation, cyclic twist can be expressed in vector form, which sometimes makes it easier to visualize. The vector magnitude and its angular phase relationship around the azimuth are defined by Equation (49):

$$\phi_r = \sqrt{\phi_{1s}^2 + \phi_{1c}^2} , \quad \psi_\phi = \tan^{-1} \frac{\phi_{1s}}{\phi_{1c}} \quad (49)$$

THE EFFECTS OF BUILT-IN TWIST ON THE DCR

For comparison purposes, a direct control rotor configuration was chosen with a similar geometry to the CTR configuration. The physical distributions of planform, mass, feathering inertia, and chordwise center of gravity have already been discussed, and the direct control rotor blade has been designated DCR-a, with planform I. Computer runs were made on the DCR-a for values of built-in twist of $\theta_x = 0.0, -4.0, -8.0$, and -10.0 degrees. The results, presented in Figure 26, show the effects of built-in twist on maximum blade tip angle of attack, peak-to-peak tip bending deflection, and shaft horsepower for three different advance ratios. Results show that tip angle of attack and power can be reduced with increased negative twist but at the cost of higher tip bending deflections. Thus, according to these curves, a good compromise for all three of the blade parameters would be a built-in twist of $\theta_x = -8$ degrees. This is a value of built-in twist that is fairly well accepted throughout the helicopter industry for the conventional rotor system.

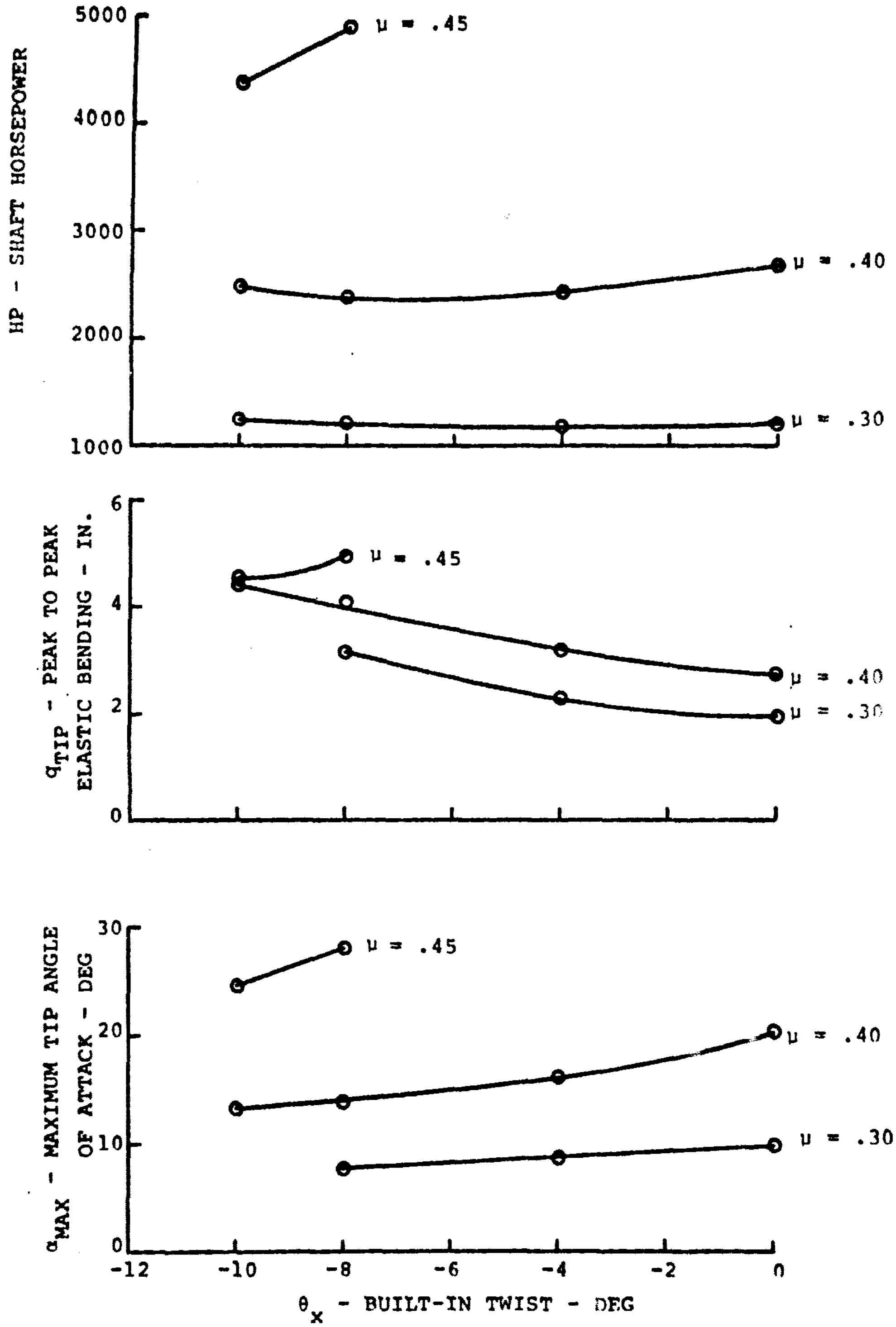

Figure 26. The Effect of Built-In Twist on the DCR-a Configuration.

THE EFFECTS OF BUILT-IN TWIST ON THE CONTROLLABLE TWIST ROTOR

Computer runs were also made on the CTR using built-in twist values of θ_x = -4.0 and -8.0 degrees, designated as CTR-A2 and CTR-A3, respectively. These were conducted at flight speeds of V = 120 knots and 160 knots. After several initial runs, it was found that an almost linear relationship exists between the control inputs and the twist response and may be expressed by the following matrix relation:

$$\begin{bmatrix} A_o \\ B_{1s} \\ A_{1s} \\ \delta_o \\ \delta_{1s} \\ \delta_{1c} \end{bmatrix} = \begin{bmatrix} a_{1,1} & a_{1,2} & a_{1,3} & a_{1,4} \\ a_{2,1} & \cdot & \cdot & \cdot \\ a_{3,1} & \cdot & \cdot & \cdot \\ a_{4,1} & \cdot & \cdot & \cdot \\ a_{5,1} & \cdot & \cdot & \cdot \\ a_{6,1} & \cdot & \cdot & a_{6,4} \end{bmatrix} \begin{bmatrix} 1.0 \\ \phi_o \\ \phi_{1s} \\ \phi_{1c} \end{bmatrix} \tag{50}$$

A minimum of four trim cases are required to evaluate the coefficients of Equation (50). If more cases are available, an accurate evaluation of these coefficients is made through the use of the multiple linear regression computer program described in Reference 7. This program evaluates the coefficients with a least-squares fit.

The value of Equation (50) lies in the fact that the twist can be specified and the controls required to achieve this twist can be determined. The effects of variations in twist on performance, angle of attack, and blade bending can be observed directly by using a minimum of computer runs.

The coefficients of Equation (50) have been evaluated for the CTR at speeds of V = 120 knots and 160 knots, and are found in Table XI for two values of built-in twist. As expected, these tables show that the most significant changes occur in the intercepts (column 1 of each group) due to the speed differences and that relatively minor changes occur in the derivatives (columns 2 through 4).

TABLE XI. COEFFICIENTS OF EQUATION RELATING THE CONTROLS TO ELASTIC TWIST

VALUES OF a_{ij}

$\mu = .3,\ \theta_x = -4.0$ Deg

i ↓ \ j →	1	2	3	4
1	8.456	-.702	-.027	.054
2	3.952	0.434	.685	.082
3	- .569	.039	-.051	.738
4	-3.570	- .784	.178	-.087
5	1.863	.395	-.733	.230
6	1.018	- .036	-.205	-.623

$\mu = .3,\ \theta_x = -8.0$ Deg

i ↓ \ j →	1	2	3	4
1	8.480	-.703	-.020	.048
2	4.115	.043	.703	.062
3	- .43	.029	-.065	.724
4	-3.199	-.779	.162	-.080
5	1.892	.394	-.743	.257
6	.945	-.023	-.196	-.597

$\mu = .4\ \ \theta_x = -4.0$ Deg

i ↓ \ j →	1	2	3	4
1	15.394	- .701	-.025	.005
2	9.751	- .042	.628	.019
3	-5.878	.031	-.035	.697
4	-6.328	- .973	.185	-.145
5	6.166	.630	-.806	.317
6	2.302	- .094	-.198	-.679

$\mu = .4,\ \theta_x = -8.0$ Deg

i ↓ \ j →	1	2	3	4
1	15.770	-.720	-.063	.029
2	10.681	-.060	.580	.032
3	-6.091	.035	-.017	.680
4	-6.011	.943	.212	-.156
5	6.227	.601	-.829	.338
6	2.519	-.100	-.197	-.676

Figures 27, 28, and 29 show the effect of elastic collective twist on the maximum tip angle of attack, peak-to-peak bending tip amplitude, and rotor shaft horsepower for the CTR system. These curves also reflect the one-per-rev cyclic twist vector magnitudes and phasing obtained for various points that were run on the computer. For these curves, the cases were chosen such that the phasing of cyclic twist was kept at approximately 60 degrees. Figure 27 shows the variations at an advance ratio of $\mu = 0.3$ and a built-in twist of $\theta_x = -8$ degrees. This curve indicates that minimum tip angle of attack, minimum bending, and minimum horsepower occur at values of collective twist of $\phi_o = -3.5$, -6.0 and -3.0 degrees, respectively. Figure 28 presents the results generated for an advance ratio of $\mu = 0.4$ and a built-in twist of $\theta_x = -8$ degrees. In this figure, the tip angle of attack and the horsepower are a minimum at $\phi_o = -5.5$ degrees. Figure 28 also shows that high values of collective twist, ϕ_o, produce high values of peak-to-peak bending displacement, q_{tip}. Figure 29 summarizes results for an advance ratio of $\mu = 0.4$ and a built-in twist of $\theta_x = -4.0$ degrees. A comparison of Figures 28 and 29 shows that the minimum power and minimum bending displacements are lower for a built-in twist of $\theta_x = -4$ degrees than for a built-in twist of $\theta_x = -8$ degrees. The tip angles of attack, however, are higher for the built-in twist of $\theta_x = -4$ degrees than those for a built-in twist of $\theta_x = -8$ degrees.

A comparison between Figures 27 and 28 shows that an increase in forward speed tends to give an increase in curvature to the tip angle of attack and horsepower curves. The minima are therefore better defined at the higher speeds. These phenomena may be due to compressibility and stall effects.

Figures 30, 31, and 32 show the effect of one-per-rev cyclic phasing, ψ_ϕ, on maximum tip angle of attack, peak-to-peak bending tip deflection, and rotor shaft horsepower. Figure 30 is for the built-in twist configuration of $\theta_x = -8$ degrees at an advance ratio of $\mu = 0.3$. In this set of curves, a vector magnitude of $\phi_r = 6.0$ degrees and a collective elastic twist of $\phi_o = -2.0$ degrees are held constant. As seen in this figure, the resulting curves are sinusoidal in character. Also at this speed, the lowest tip angle of attack occurs at $\psi_\phi = 180$ degrees, while minimum bending deflections and minimum horsepower occur at $\psi_\phi = 60$ degrees and 90 degrees, respectively. It should be noted that the angles of attack are well below stall for all cyclic twist phasing. Figure 31 is a similar set of curves for the CTR configuration with a built-in twist of $\theta_x = -8$ degrees at an advance ratio of $\mu = 0.4$. Values of collective twist and vector twist, ϕ_o and ϕ_r, are constant at values of -2.0 and 6.0 degrees, respectively. In these curves it is seen that there is less of a sinusoidal character than in Figure 30. The bending tip deflections and

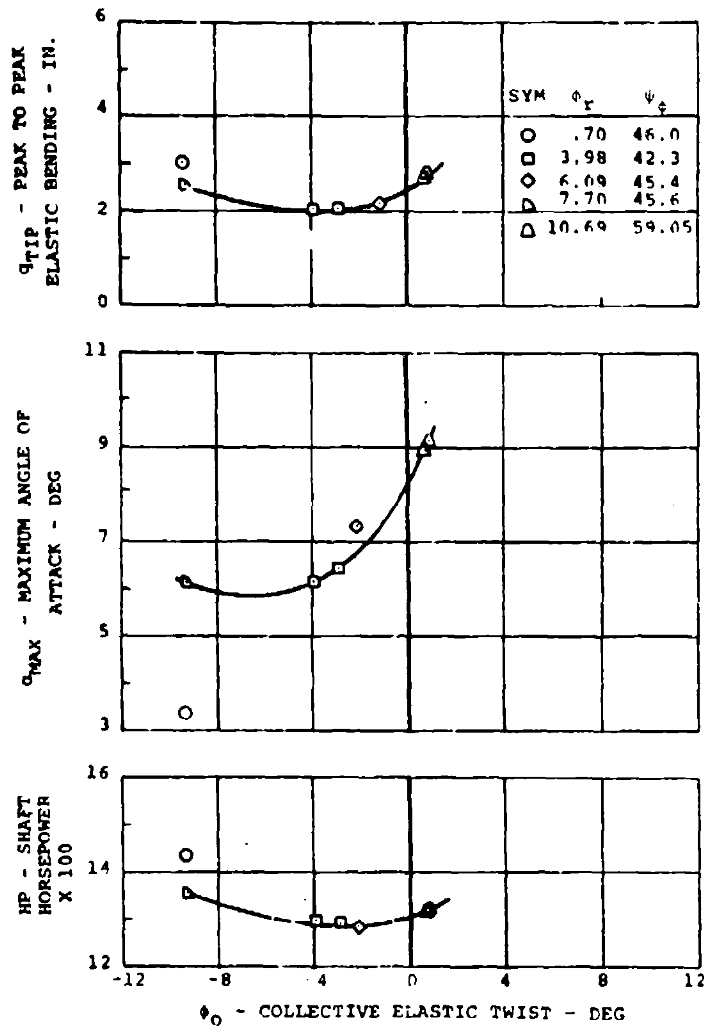

Figure 27. The Effect of Collective Twist on Shaft Horsepower, Elastic Bending, and Maximum Tip Angle of Attack for the CTR-A3 Configuration; V = 120 Kts; θ_x = -8 Deg.

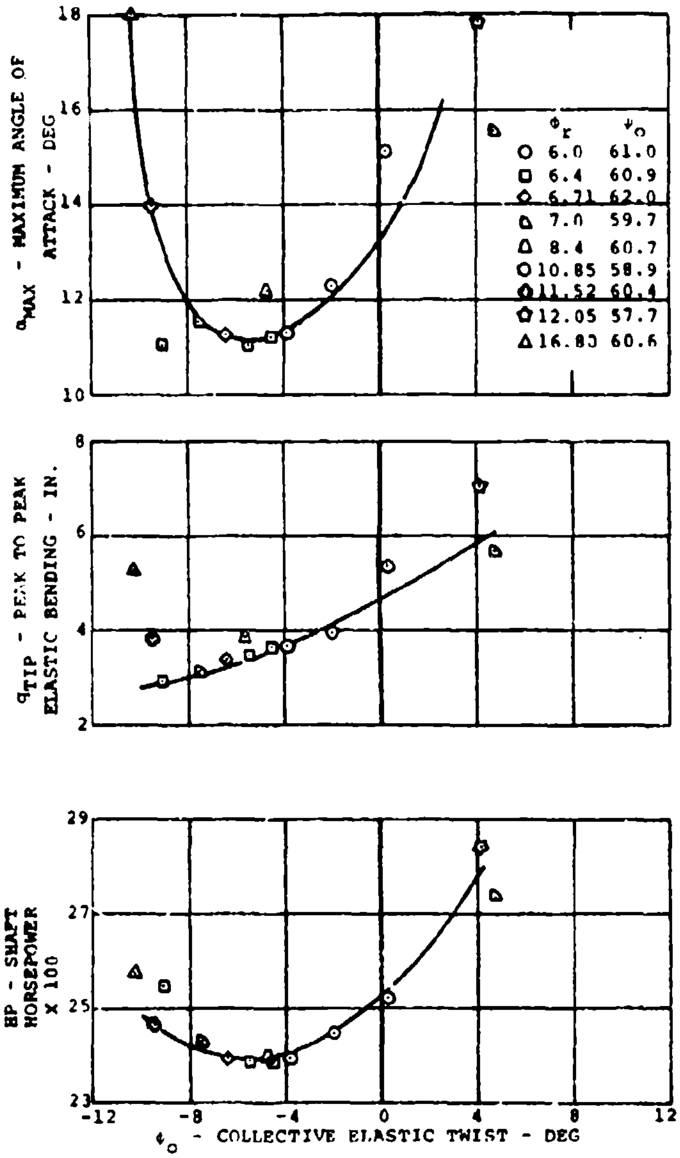

Figure 28. The Effect of Collective Elastic Twist on Shaft Horsepower, Elastic Bending, and Maximum Tip Angle of Attack for the CTR-A3 Configuration; V = 160 Kts; θ_x = -8 Deg.

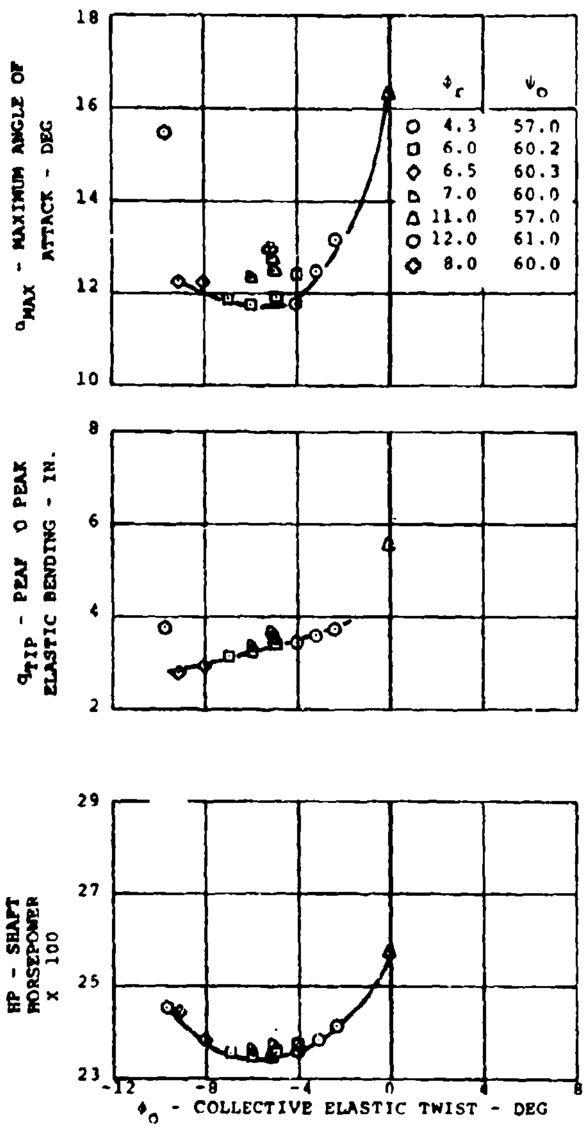

Figure 29. The Effect of Collective Elastic Twist on Shaft Horsepower, Elastic Bending, and Maximum Tip Angle of Attack for the CTR-A2 Configuration: V = 160 Kts; θ_x = -4 Deg.

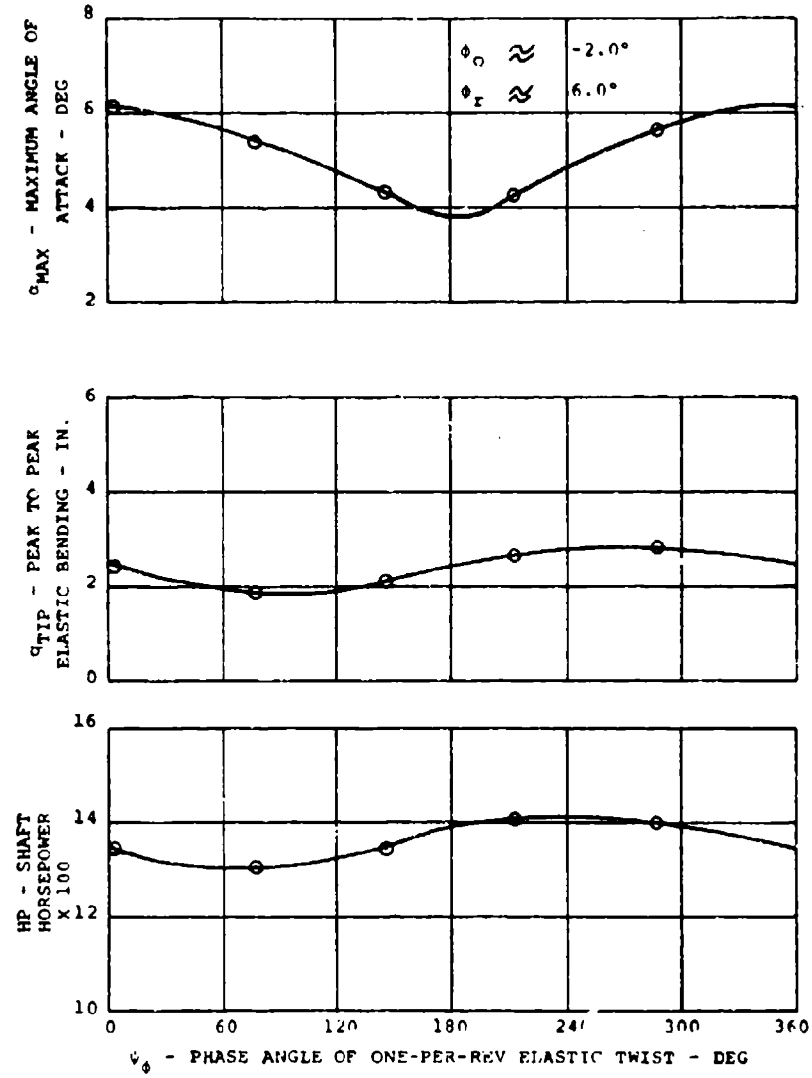

Figure 30. The Effect of Cyclic Twist Phasing on Shaft Horsepower, Elastic Bending, and Maximum Tip Angle of Attack for the CTR-A3 Configuration; V = 120 Kts; θ_x = -8 Deg.

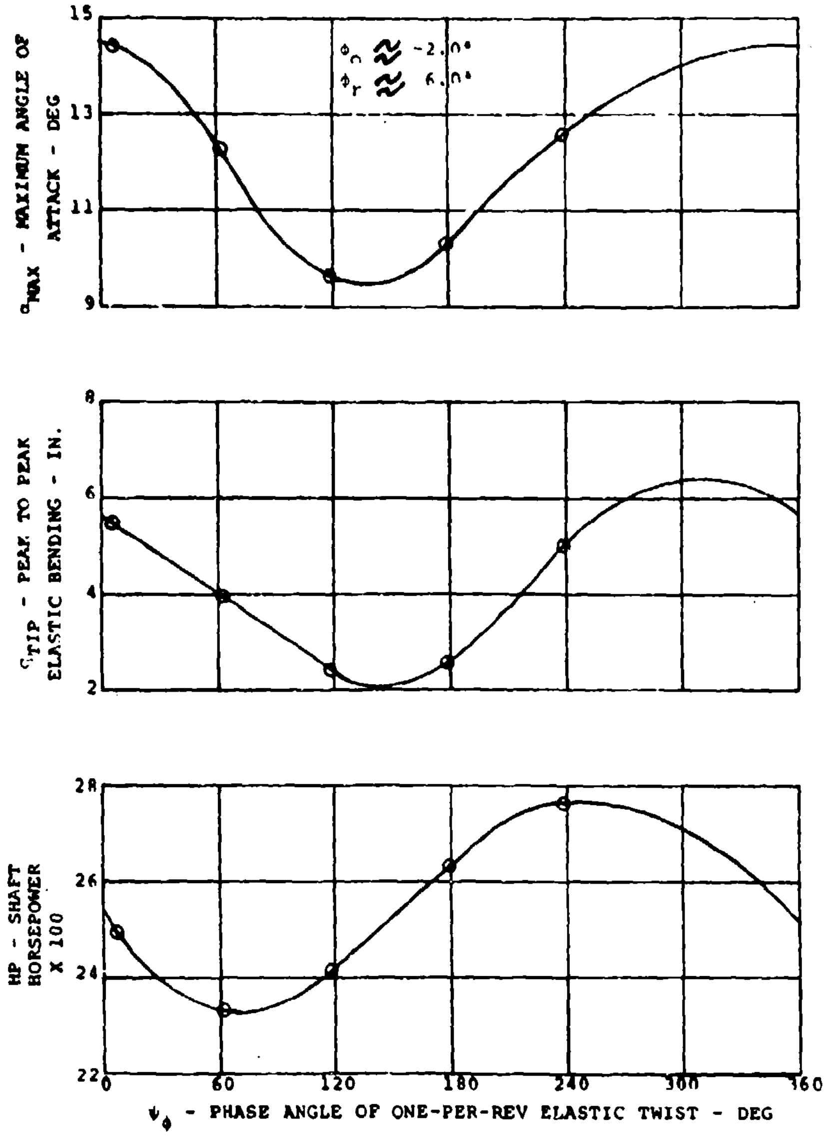

Figure 31. The Effect of Cyclic Twist Phasing on Shaft Horsepower, Elastic Bending, and Maximum Tip Angle of Attack for the CTR-A3 Configuration; V = 160 Kts; θ_x = -8 Deg.

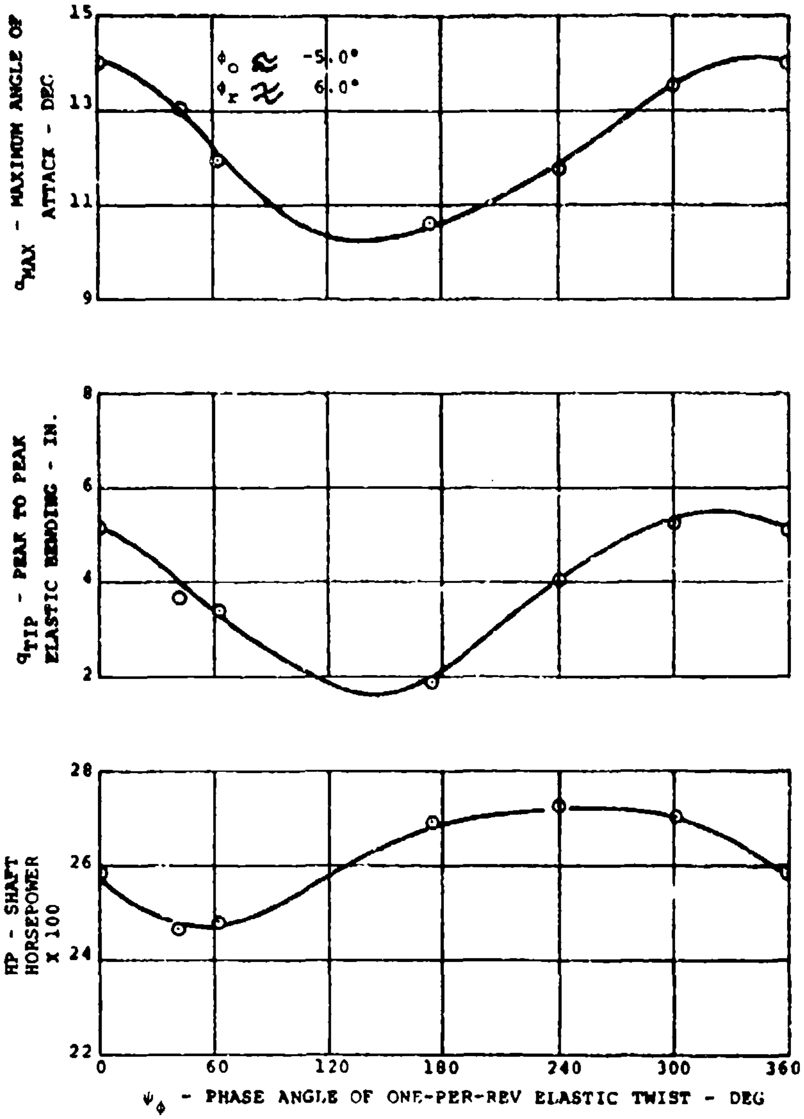

Figure 32. The Effect of Cyclic Twist Phasing on Shaft Horsepower, Elastic Bending, and Maximum Tip Angle of Attack for the CTR-A2 Configuration; V = 160 Kts; θ_x = -4 Deg.

the tip angle of attack do not have a minimum at the same cyclic twist phase that occurs at minimum horsepower. Bending and tip angle are minimum at ψ_ϕ = 140 degrees while horsepower is minimum at ψ_ϕ = 60. Figure 32 shows the effect of cyclic twist phasing for the built-in twist configuration of θ_x = -4.0 degrees at an advance ratio of μ = 0.4. In this figure, ϕ_o and ϕ_r are held at approximately -5.0 and 6.0 degrees, respectively. As in Figure 31, minimum bending and tip angle of attack do not occur at minimum horsepower. Minimum horsepower occurs at ψ_ϕ = 60 degrees, whereas minimum bending occurs at ψ_ϕ = 140 degrees.

The effects of built-in twist on the four-bladed CTR and DCR configurations are shown in Figure 33, where shaft horsepower is plotted as a function of built-in twist for both rotor systems, for forward flight speeds of V = 120, 160, and 180 knots. These curves were developed for the CTR-A1, A2, and A3 configurations as well as the DCR-a1, a2, a3, and a4 configurations. As previously mentioned, the DCR had a best built-in twist of θ_x = -8 degrees, and, as the curves indicate, the CTR had a best built-in twist of θ_x = -2.0 degrees, at speeds of V = 120 and 160 knots. Data for these cases can be found in Tables XII through XVI. Table XVII summarizes data generated for the DCR-a configuration with five and six blades.

THE EFFECTS OF FAIRED FLAP

The CTR-B2 configuration consists of a faired flap rather than an external flap. The aerodynamic data for these airfoil sections was described previously. Computer cases were run on this configuration with a built-in twist of θ_x = -2 degrees at a flight speed of V = 160 knots and are shown in Table XVIII. Figure 34 shows the effect of collective elastic twist, vector twist, and twist phasing on rotor horsepower. Here the minimum rotor power occurs at a collective elastic twist of ϕ_o = -7.0 degrees, a vector twist of ϕ_r = -4.0 degrees, and a twist phasing of ψ_ϕ = 45 degrees. The lowest value of horsepower on this curve is P = 2231 horsepower, which is approximately 100 horsepower lower at 160 knots than that of the CTR-A2 configuration having an external flap. This is as expected because of the reduced drag of the faired flap configuration. Consequently, faired flap data were used in all succeeding computer runs.

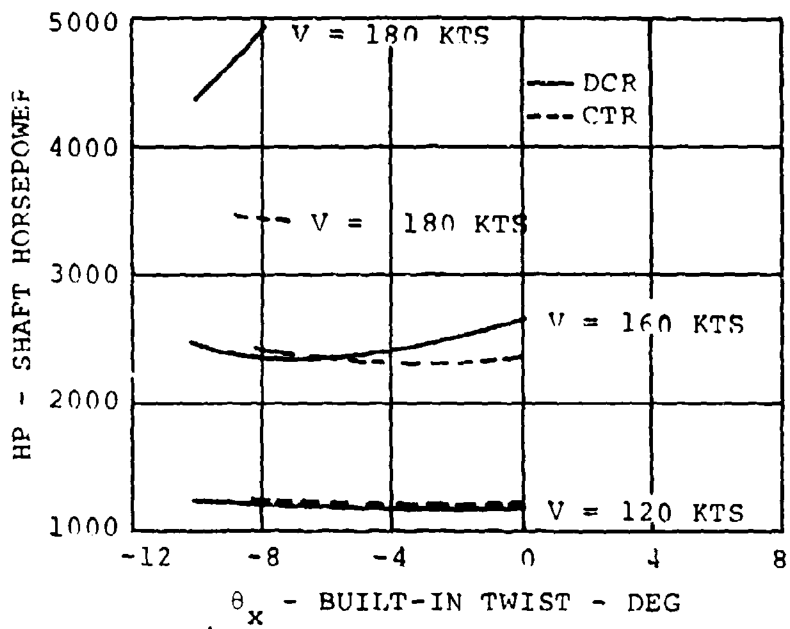

Figure 33. The Effect of Built-In Twist on the Minimum Horsepower for the 4-Bladed CTR-A and DCR-a.

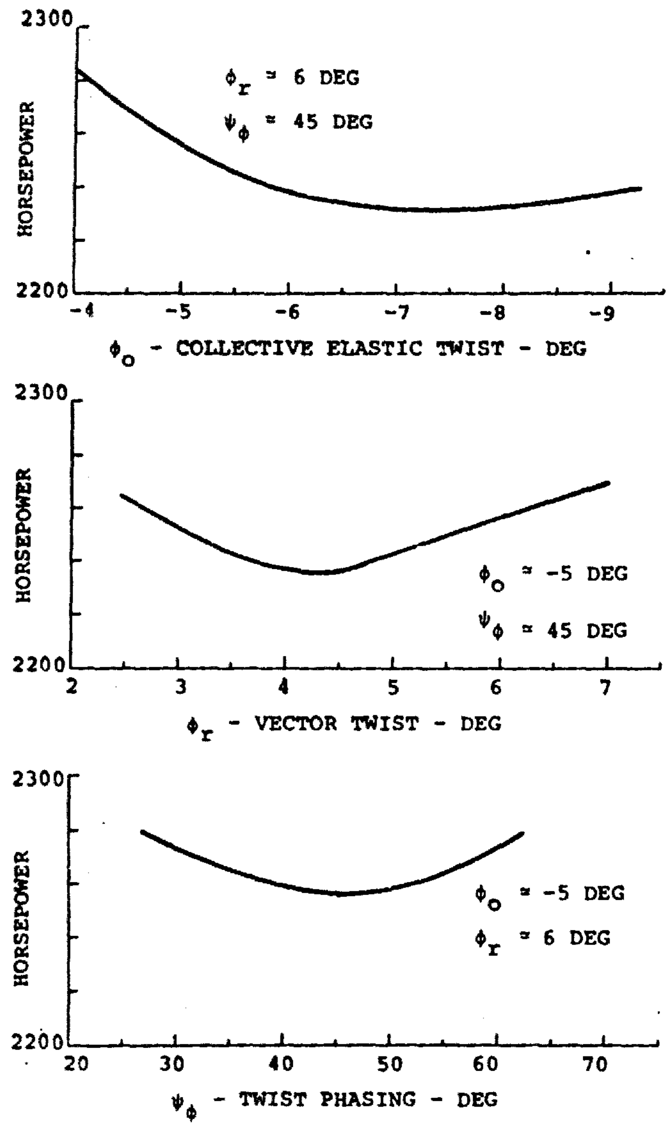

Figure 34. The Minimum Power Required for the CTR-B2 Configuration Using a Faired Flap; V = 160 Kts; θ_x = -2 Deg; Tip Flap.

INBOARD FLAP

The CTR-E configuration has a 42-inch faired flap located at the 75-percent radius. Data for the computer runs on this configuration are found in Table XIX. These runs were also made at a flight speed of V = 160 knots. Of all the cases run on this configuration, the lowest value of tip angle of attack achieved was α_{max} = 19.4 degrees. Although the power requirements for this configuration were low, the angles of attack are unacceptable because they are above stall. Thus, it was concluded that the tip flap was more beneficial.

TORSIONAL STIFFNESS

Computer cases were run on the CTR-B2, C1, and C2 configurations; the results are found in Tables XVIII, XXVIII, and XXIX. These cases represent runs using nonrotating torsional frequencies of ω_t = 6.76, 8.28, and 9.43 cycles per second. The CTR-B2 configuration has already been discussed but is presented here for comparison purposes. Figure 35 shows the effects of collective elastic twist, vector twist, and twist phasing on the rotor horsepower required for the three configurations of different torsional stiffnesses. In general, it is seen that the torsional stiffness effects are slight and the CTR-B2 configuration still has the lower power requirements. Thus, the torsional stiffness of the CTR-B2 configuration was used for the remainder of the analysis.

CONTROL FLAP SIZE

Computer cases were run for the CTR-F, B2, and G configurations the data for which may be found in Tables XXI, XVIII, and XXII. These cases represent, respectively, rotor blades with flaps that are 38, 48, and 58 inches long. The B2 configuration was discussed previously but is shown here for comparison purposes. Again, the evaluation was made at a flight speed of V = 160 knots. Figure 36 shows the effect of collective elastic twist, vector twist, and twist phasing on rotor horsepower. It is clearly seen that the longer flap has the lowest power requirements. The CTR-G configuration was chosen as the optimum configuration.

THE EFFECT OF FORWARD SPEED

The CTR-G configuration was sized and optimized at 160 knots. Additional computer runs were made on this configuration at V = 0.0, 120, and 180 knots. The results of the cases at these speeds are found in Tables XXIV, XXV, and XXVI. Even though the basic configuration geometry has been optimized, it is still necessary to optimize the control requirements at the

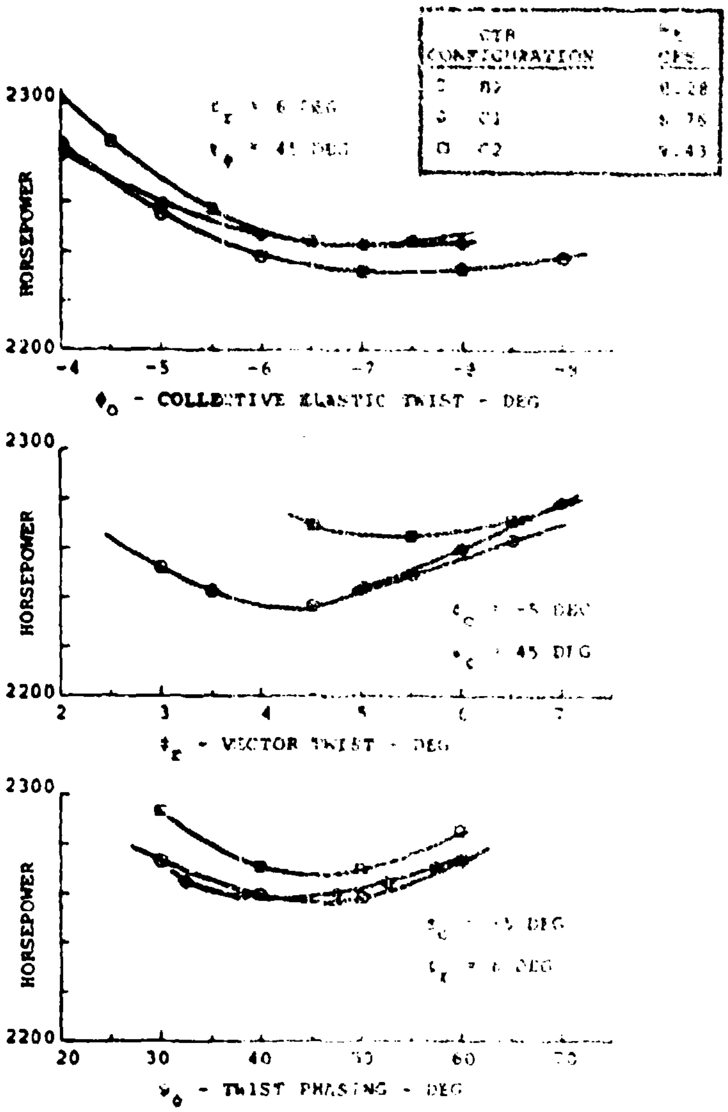

Figure 35. The Effects of Torsional Frequency on the Shaft Horsepower Required for the CTR; V = 160 Kts; θ_x = -2 Deg; Tip Flap.

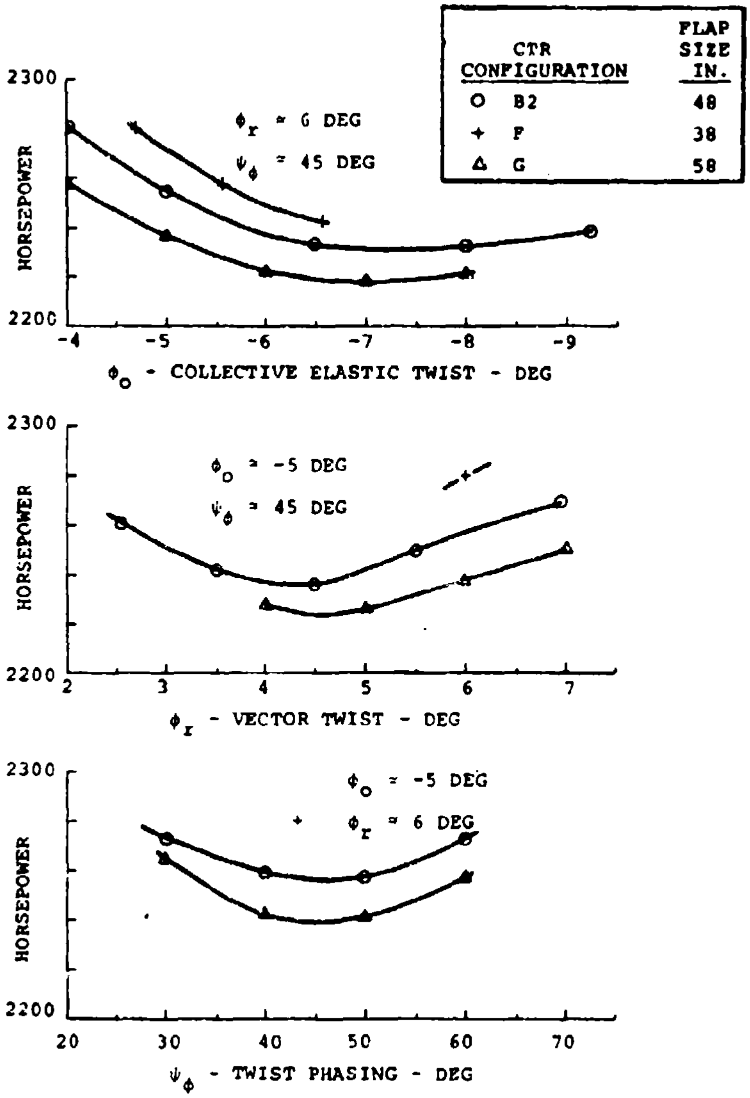

Figure 36. The Effects of Servo-Flap Size on the Shaft Horsepower Required for the CTR; V = 160 Kts; θ_x = -2 Deg; Tip Flap.

various speeds based on minimum horsepower or angle of attack limitations.

Figure 37 shows rotor power required as a function of collective elastic twist, ϕ_o, for the CTR-G configuration at hover. For this condition, the one-per-rev cyclic flap motions were set to zero such that only the effects of collective flap are considered. It is therefore evident that the cyclic twist will also be zero. This curve indicates that minimum horsepower occurs at a collective elastic twist of $\phi_o = -8$ degrees.

Figure 38 presents the rotor horsepower required for the CTR-G configuration at a forward speed of V = 120 knots as a function of collective elastic twist, vector twist, and cyclic twist phasing. Figure 38 shows that minimum power occurs at a collective elastic twist of $\phi_o = -8$ degrees, vector twist $\phi_r = 1.5$ degrees, and cyclic twist phasing $\psi_\phi = 30$ degrees. The minimum horsepower obtained from any of these points is P = 1145 horsepower.

Figure 39 shows the results for the G configuration at V = 180 knots. Rotor horsepower and maximum tip angle of attack are shown as a function of collective elastic twist, vector twist, and cyclic elastic twist phasing. At this speed, power must be optimized with explicit consideration for tip angle of attack to avoid stall. Over the range of study on these curves, it is seen that angle of attack has little variation with collective twist and cyclic twist phasing. However, the slope of the power variation with vectored twist is negative, whereas the slope of maximum tip angle of attack with vector twist is positive. The choice of a value for vector twist should then be made where the maximum angle of attack is equal to the stall angle for the blade section. This will provide the minimum horsepower allowable before the rotor stalls. The unstalled case with the minimum power setting chosen for this run was with a collective elastic twist of $\phi_o = -9.3$ degrees and a vector twist of $\phi_r = 2.2$ degrees at a cyclic twist phasing of $\psi_\phi = 88$ degrees.

In order to maintain trim with elastic twist, and to achieve minimum horsepower, certain relationships must exist between the servo flap controls and the pitch horn controls. Figure 40 shows how the elastic twist and the two controls relate to each other. Here the collective and cyclic elastic twist, the collective and cyclic flap, and the collective and cyclic pitch horn deflections are plotted as a function of forward speed. The results are as expected, with the collective values having a parabolic shape with forward speed and the cyclic values increasing with forward speed.

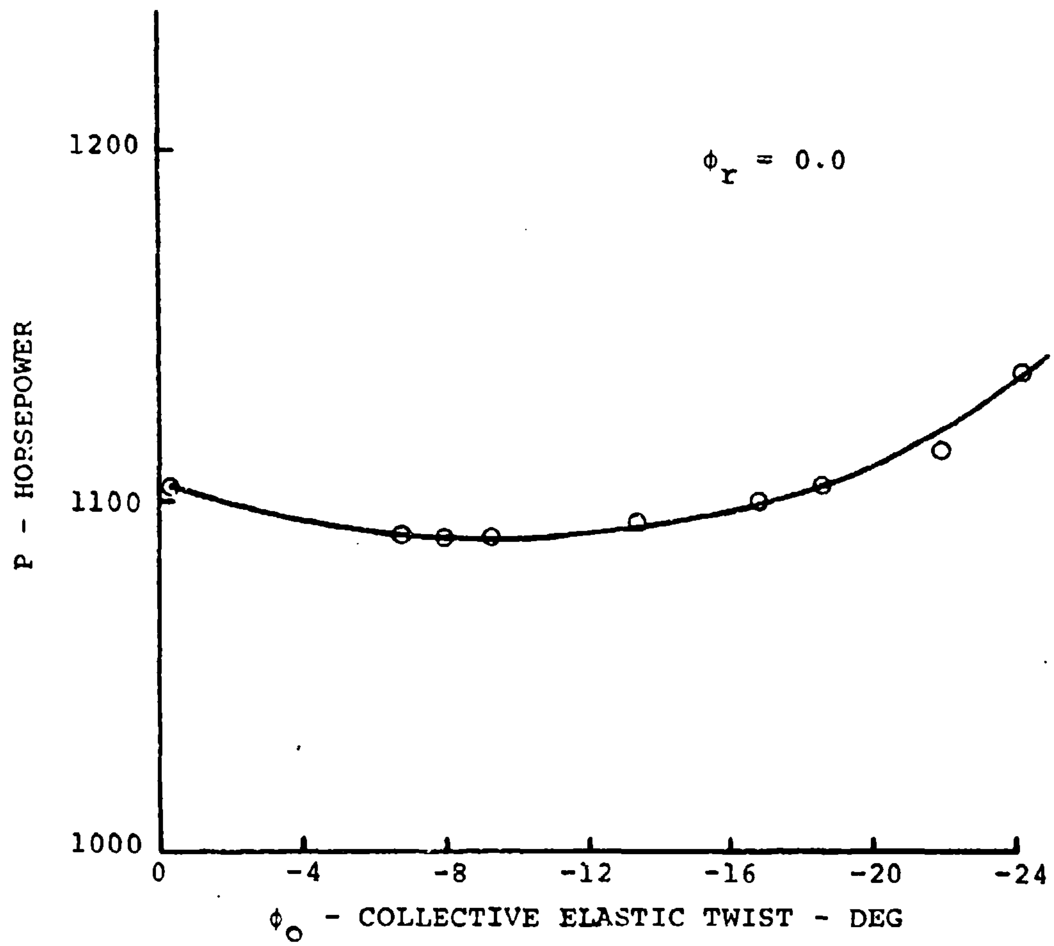

Figure 37. Horsepower as a Function of Collective Elastic Twist for the CTR G Configuration; V = 0.0 Kts.

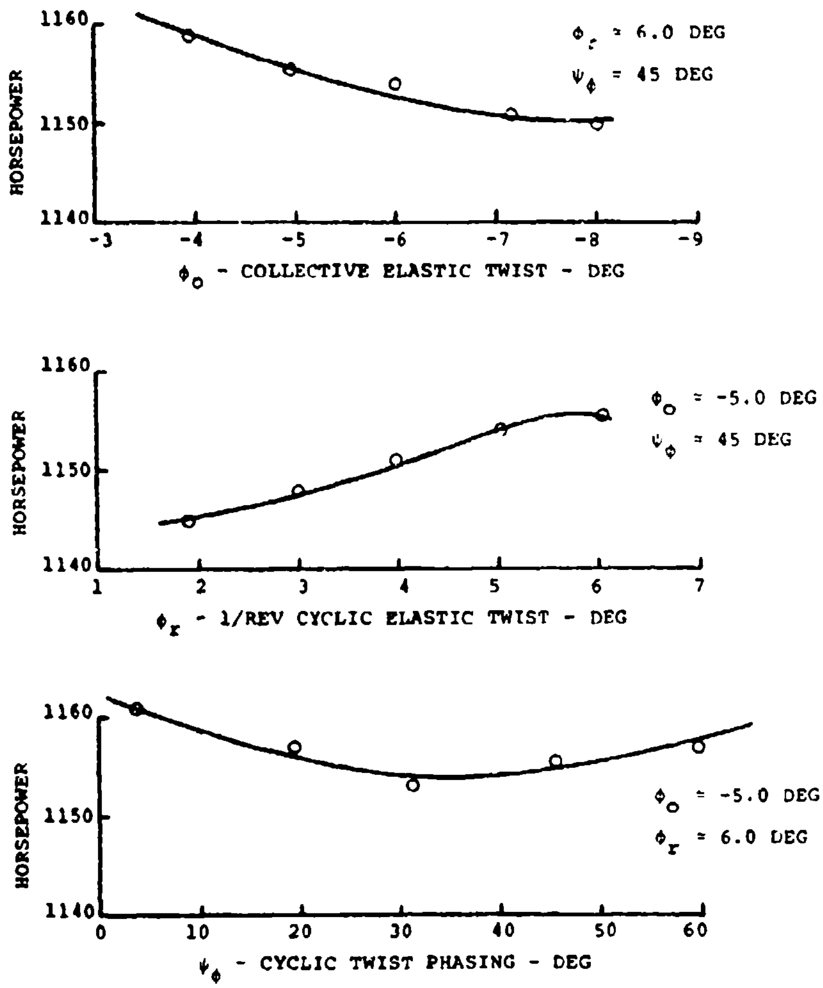

Figure 38. Horsepower as a Function of Elastic Twist for the CTR Configuration G; V = 120 Kts.

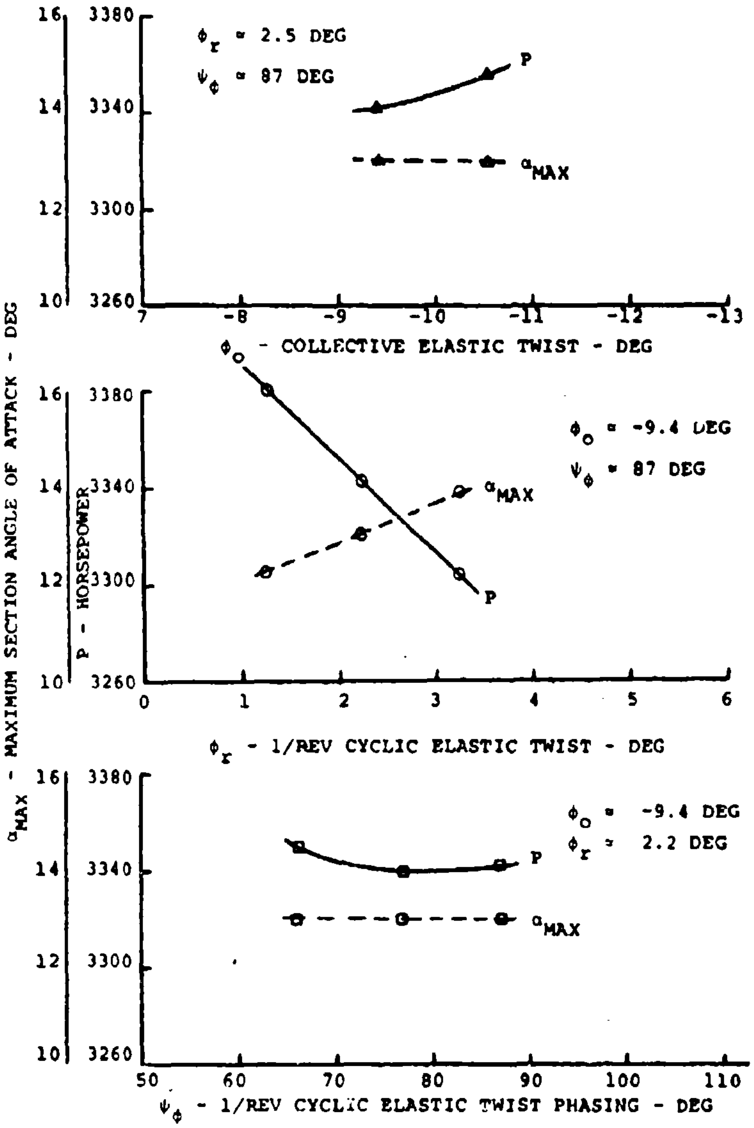

Figure 39. The Effect of Elastic Twist on Horsepower and Maximum Angle of Attack for the G Configuration at 180 Kts; V = 180 Kts.

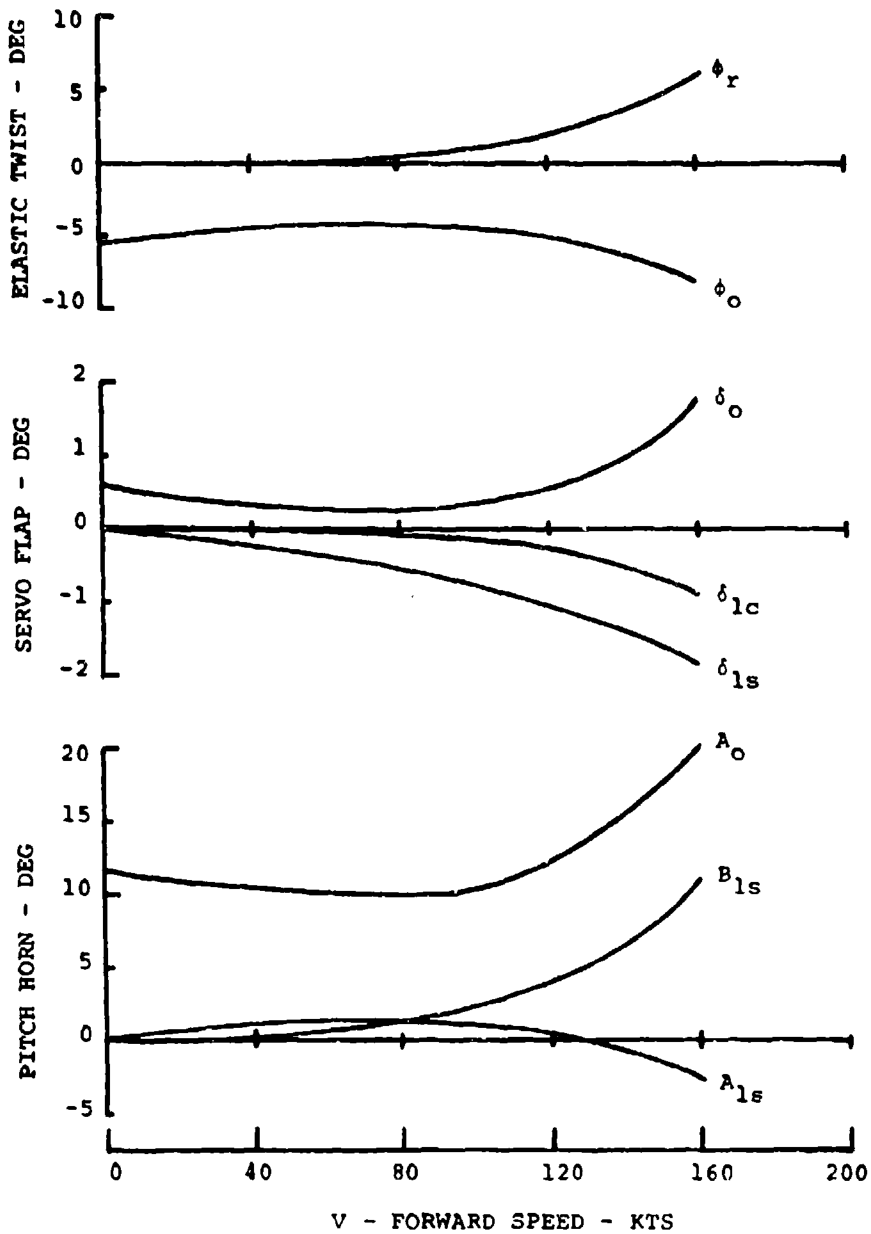

Figure 40. Elastic Twist Response and Control Inputs as a Function of Forward Speed for the CTR-G Configuration.

TABLE XII. LIST OF COMPUTER RUNS FOR THE DIRECT CONTROL ROTOR SHOWING THE EFFECTS OF BUILT-IN TWIST. ROTOR CONFIGURATION I

CASE NO.	μ	θ_x (deg)	α_r (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	Y (lb)	α_{max} (deg)	P HP
101-12	.3	- 8	- 9.4	9.721	4.194	- 1.326	11444	1187	24.3	7.64	1206
102-14	.3	- 4	- 9.4	9.699	3.986	- 1.449	11484	1199	28.3	8.76	1187
103- 1	.4	- 4	-14.6	15.5	8.5	- 8.2	10253	1864	- 770.0	13.24	2111
2				14.9	7.9	- 5.5	9965	1733	- 299.0	12.73	1979
3				16.0	8.0	- 8.5	11496	1969	- 818.0	15.35	2261
4				16.3	8.3	- 8.0	11671	2045	- 682.0	16.41	2325
5				16.5	8.7	- 7.8	11639	2116	- 622.0	16.22	2355
6				16.623	9.07	- 8.09	11484	2164	- 676.0	16.04	2373
7				16.812	9.44	- 8.90	11322	2201	- 829.0	15.88	2405
8				16.892	9.41	- 8.52	11495	2221	- 739.0	16.34	2428
104- 1	.4	- 8	-14.6	15.5	8.5	- 8.2	11014	1912	- 808.0	12.47	2180
2				14.9	7.9	- 5.5	10666	1765	- 308.0	11.98	2048
3				16.0	8.0	- 8.5	12346	2028	- 854.0	14.60	2340
4				16.3	8.3	- 8.0	12538	2105	- 706.0	15.32	2395
5				16.5	8.7	- 7.8	12490	2180	- 638.0	15.49	2430
6				18.159	11.24	-10.57	12122	2594	-1053.0	16.67	2758
7				16.223	9.88	- 8.87	10876	2128	- 886.0	12.91	2307
8				16.213	9.56	- 8.07	11311	2169	- 733.0	13.41	2327
9				16.370	9.60	- 8.19	11530	2217	- 748.0	13.73	2368
10				16.357	9.61	- 8.17	11506	2215	- 743.0	13.69	2364
105- 1	.3	0.0	- 9.4	13.8	7.5	- 7.4	15091	2145	-1019.0	16.63	1967
2				12.0	4.5	- 2.0	15300	1497	205.0	15.23	1509
3				9.0	3.5	- 0.5	9716	986	177.0	8.43	1064
4				9.5	4.0	- 1.5	10605	1168	34.0	9.18	1152
5				10.85	4.285	- 1.351	13901	1474	199.0	12.24	1352
6				10.0989	4.157	- 1.958	12136	1326	- 16.0	10.47	1252
7				9.6747	3.758	- 1.622	11406	1190	47.0	9.78	1180
8				9.7489	3.783	- 1.668	11681	1209	25.0	9.92	1192
106- 1	.4	0.0	-14.6	13.8	7.5	- 7.4	6937	1112	- 553.0	10.61	1609
2				15.5	8.0	- 7.8	10009	1814	- 667.0	14.6	2089
3				16.0	8.3	- 8.5	10392	1917	- 773.0	15.66	2203
4				16.3	8.6	- 8.2	10577	1997	- 696.0	16.29	2264
5				16.5	8.7	- 8.8	10653	2016	- 796.0	16.63	2310
6				17.076	9.092	- 8.685	10936	2117	- 724.0	17.89	2428
7				17.738	9.242	- 9.124	11334	2168	- 743.0	19.61	2590
8				18.055	9.419	- 9.309	11426	2201	- 743.0	20.23	2201
107- 1	.46	-10.0	-17.6	23.0	15.5	-13.8	10231	2833	- 991.0	18.71	3569
2				24.0	15.8	-14.2	10667	3038	- 879.0	20.94	3889
3				23.5	16.0	-14.7	10179	2919	-1109.0	19.14	3688
4				24.5	16.3	-15.0	11013	3018	- 931.0	22.22	4060
5				24.8	15.6	-15.3	10979	3081	- 946.0	22.53	4135
6				25.211	14.368	-17.529	11710	1257	-1323.0	24.07	4330
7				20.211	9.368	-12.529	11819	1930	-1007.0	19.13	3148
8				28.372	15.941	-20.331	11255	3427	-1251.0	28.25	5242
9				26.725	10.992	-20.989	12384	2338	-1624.0	28.37	4929
10				27.358	14.980	-19.987	11372	3184	-1396.0	26.47	4957
11				25.269	13.965	-17.618	11636	2820	-1278.0	24.60	4366

TABLE XIII. LIST OF COMPUTER RUNS FOR THE CTR-A2 CONFIGURATION. V = 120 KTS

CASE NO.	μ	θ_x (deg)	α_r (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	P HP	α_{max} (deg)
200- 1	.3	-4.0	-9.5	16.82	3.67	8.18	4.000	2.000	-5.000	12909	1342	139	1644	19.4
2							4.200	1.800	-4.800	12545	1318	195	1624	18.4
3							4.400	2.200	-5.200	11039	1138	105	1507	18.3
4							3.800	2.400	-5.400	13170	1337	30	1660	17.8
5							4.219	2.442	-5.442	11481	1186	43	1594	18.7
6							4.208	2.516	-5.516	11429	1178	27	1594	18.8
7							4.207	2.498	-5.498	11444	1179	31	1594	18.8
8							4.219	2.513	-5.513	11378	1171	28	1591	18.8
9							4.216	2.508	-5.508	11397	1174	29	1592	18.8
10							4.191	2.501	-5.501	11515	1188	29	1597	18.8
201- 1				13.33	3.61	3.34	1.000	1.100	-2.000	11259	1176	29	1341	9.3
2							1.800	1.500	-2.500	7775	707	-65	1170	8.7
3							0.750	0.750	-3.000	14573	1260	-72	1400	12.0
4							2.000	2.000	-3.500	4728	150	-50	977	8.8
5							0.971	1.071	-2.002	11492	1197	35	1349	9.4
6							0.970	1.064	-1.996	11511	1199	37	1349	9.4
7							0.964	1.083	-2.012	11507	1198	32	1350	9.4
8							0.961	1.090	-2.015	11497	1197	31	1349	0.4
9							0.972	1.084	-2.027	11463	1191	29	1347	9.4
10							1.160	0.828	-2.101	11271	1144	33	1326	9.4
11							0.934	1.135	-2.013	11510	1202	28	1352	9.5
202- 1				8.31	5.53	-7.93	-4.000	-2.000	5.000	8974	761	-205	1177	7.1
2							-3.500	-2.500	4.500	8343	632	-244	1114	6.2
3							-4.500	-1.750	5.250	10410	912	-160	1262	8.2
4							-4.250	-2.250	5.250	10401	865	-119	1248	8.1
5							-5.589	-0.859	7.072	11102	1172	112	1411	10.5
6							-5.683	-0.636	6.772	11427	1198	40	1418	10.5
7							-5.678	-0.639	6.648	11498	1197	28	1417	10.4
203- 1	.3	-4.0	-9.6	10.5	4.75	2.5	-1.800	0.770	-2.230	14383	1329	73	1364	10.0
2							-1.300	0.700	-1.250	11317	1233	155	1278	7.8
3							-1.000	0.650	-1.000	9691	1080	147	1207	6.4
4							-1.500	0.820	-1.750	12411	1282	91	1312	8.6
5							-1.346	0.931	-1.852	11489	1203	32	1273	8.1
6							-1.347	0.934	-1.871	11494	1201	29	1273	8.1
7							-2.9	1.9	-1.1	15515	1650	294	1517	11.1
204- 1				6.47	8.89	3.66	-3.000	-1.000	-4.000	2697	55	41	766	4.8
2							-3.500	-1.500	-3.500	5565	522	72	970	6.3
3							-4.000	-0.500	-3.000	5041	508	74	961	6.2
4							-3.750	-2.000	-4.500	8643	778	27	1114	8.3
5							-4.729	-1.527	-4.123	11346	1054	127	1272	10.1
6							-7.243	-0.037	-3.032	16132	1236	539	1572	13.7
7							-4.419	-1.825	-4.325	10869	976	97	1232	9.7
8							-4.425	-1.817	-4.307	10863	978	99	1233	9.7
9							-4.774	-1.221	-4.279	11025	1045	65	1264	10.0
10							-5.607	0.075	-4.067	11526	1219	20	1349	11.0
11							-5.504	-0.107	-4.088	11505	1198	29	1340	10.9
12							-5.509	-0.094	-4.087	11502	1200	29	1340	10.9
205- 1				10.03	4.80	2.91	-1.000	1.100	-2.000	7625	736	28	1072	5.8
2							-0.500	1.500	-2.250	4298	189	8	870	4.2
3							-1.500	0.500	-1.500	11312	1149	228	1246	7.7
4							-1.250	0.750	-1.800	9695	983	106	1172	6.9
5							-1.218	0.280	-2.232	11215	1044	111	1208	7.7
6							-1.293	0.317	-2.126	11346	1063	130	1219	7.8
7							-2.586	2.597	-1.791	11509	1312	18	1326	9.1
8							-2.024	1.683	-2.137	11505	1193	28	1275	8.7

TABLE XIII - Continued

CASE NO.	μ	α_x (deg)	α_r (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	P HP	α_{max} (deg)
206- 1	.3	-4.0	-9.5	6.89	7.70	1.26	-3.000	-1.000	-2.000	4492	325	-26	883	4.7
2							-3.500	-1.500	-2.500	8386	772	-49	1006	7.1
3							-2.500	-0.500	-1.500	312	-476	52	561	2.2
4							-4.000	0.500	-1.000	4582	427	-3	930	5.3
5							-6.593	2.167	-0.184	11278	1572	139	1407	10.6
6							-4.353	0.677	-2.504	7301	785	-163	1089	7.4
7							-5.858	1.570	-2.864	11892	1279	-293	1376	11.0
8							-7.216	2.496	-1.374	13784	1652	-6	1585	12.6
9							-6.369	1.968	-2.119	12411	1436	-171	1450	11.5
10							-6.152	1.592	-2.056	12296	1400	-132	1427	11.1
11							-4.997	-0.245	-1.850	11372	1182	26	1305	9.4
12							-5.049	-0.191	-1.844	11462	1194	27	1312	9.5
13							-5.067	-0.175	-1.838	11502	1200	26	1315	9.6
207- 1				12.63	3.52	3.51	1.000	1.100	-2.000	8346	801	50	1177	5.4
2							1.500	1.500	-2.500	4957	222	28	980	3.7
3							0.750	0.750	-3.000	11745	1062	-55	1281	7.9
4							2.000	2.000	-3.500	1965	-413	134	771	2.3
5							0.641	0.760	-2.189	11536	1133	89	1302	7.4
6							0.618	0.707	-1.951	11602	1161	139	1311	7.3
7							0.499	1.008	-2.164	11584	1162	74	1316	7.5
8							0.171	1.663	-2.162	11435	1201	17	1338	7.8
9							0.220	1.552	-2.156	11498	1199	26	1336	7.7
208- 1				7.27	6.69	4.66	-4.000	2.000	-4.500	6773	677	-39	1038	8.2
2							-4.500	2.500	-5.000	8319	862	-140	1136	9.6
3							-4.750	3.000	-5.000	8272	889	-167	1150	9.9
4							-5.000	2.250	-4.250	10379	1125	-10	1263	10.6
5							-4.822	1.438	-4.289	11416	1126	57	1281	10.9
6							-5.262	2.207	-4.185	11494	1217	26	1323	11.3
7							-5.195	2.092	-4.227	11504	1203	28	1317	11.2
8							-5.181	2.067	-4.230	11498	1199	29	1315	11.2
9							-5.183	2.071	-4.232	11504	1200	28	1316	11.2

TABLE XIII - Continued

CASE NO.	γ	θ_x (deg)	α_r (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	P HP	α_{max} (deg)
209- 1	.3	-4.0	-9.6	4.70	4.80	-6.08	-3.500	-2.600	4.700	5936	338	-6	988	5.3
2							-4.300	-1.800	5.300	7217	564	59	1092	6.9
3							-4.800	-2.300	5.600	10383	841	305	1249	8.4
4							-5.500	-0.500	4.800	10266	923	21	1257	8.7
5							-6.594	0.906	5.417	11181	1104	51	1378	10.3
6							-6.718	1.086	5.271	11404	1181	18	1387	10.5
7							-6.793	1.154	5.340	11489	1198	27	1398	10.6
8							-6.800	1.156	5.349	11505	1200	29	1399	10.6
210- 1			-9.4	13.72	1.67	4.37	1.000	3.000	-2.000	9962	935	64		10.1
2							1.134	1.163	2.272	9872	1200	851		
3							1.300	3.500	-2.200	6705	478	42	1156	10.1
4							1.500	1.700	-1.100	9792	943	288	1304	9.5
5							0.833	2.754	-2.167	11538	1125	77	1387	11.1
6							-0.466	5.127	-1.601	11278	1306	-54	1488	11.4
7							0.348	3.620	-2.069	11504	1200	27	1425	11.1
8							0.355	3.607	-2.061	11498	1199	29	1424	11.1
9							0.352	3.612	-2.062	11506	1201	28	1425	11.1
211- 1				14.76	3.18	3.66	2.000	1.000	-2.100	11305	1176	28	1386	10.5
2							2.400	1.600	-1.500	6553	536	62	1153	9.0
3							2.800	2.000	-2.400	4313	49	48	988	9.2
4							3.000	1.300	-1.750	4388	69	88	990	8.9
5							2.000	0.934	-2.108	11502	1191	35	1391	10.6
6							1.948	1.064	-2.169	11491	1196	13	1394	10.6
7							2.024	0.810	-1.935	11561	1205	77	1395	10.4
8							1.957	1.022	-2.103	11487	1198	28	1394	10.6
9							1.956	1.020	-2.103	11484	1197	29	1394	10.6
212- 1	.3	-4.0	-9.4	7.09	9.15	0.34	-5.000	-2.000	-2.100	15052	1313	36	1471	11.5
2							-4.400	-2.300	-2.400	13690	1220	-69	1387	10.5
3							-4.800	-2.700	-2.900	16189	1081	-11	1442	12.4
4							-5.200	-3.100	-3.300	17390	518	9	1385	17.3
5							-5.066	-1.062	-0.911	12634	1477	91	1448	9.8
6							-4.870	-1.192	-1.002	12233	1427	65	1418	9.5
7							-4.621	-1.428	-1.132	11858	1362	44	1384	9.2
8							-4.083	-2.177	-1.501	11547	1226	23	1328	8.8
9							-3.908	-2.310	-1.546	11528	1207	24	1321	8.7
10							-3.941	-2.392	-1.548	11477	1198	29	1315	8.7
213- 1				6.59	7.87	4.59	-4.000	2.000	-5.000	10179	1217	-197	1297	10.6
2							-4.300	2.300	-4.700	10569	1316	-168	1340	10.9
3							-4.600	1.900	-5.200	12971	1409	-195	1444	12.5
4							-5.000	1.200	-4.300	15104	1493	172	1540	13.4
5							-4.048	1.257	-4.653	11728	1337	-67	1363	11.1
6							-1.670	-0.232	-4.856	4724	373	4	903	6.0
7							-3.896	0.937	-4.567	11715	1316	-27	1351	10.8
8							-3.886	0.918	-4.568	11714	1314	-26	1350	10.8
9							-3.260	-0.099	-4.640	11354	1179	17	1286	10.0
10							-3.277	-0.104	-4.623	11413	1185	23	1289	10.0
11							-3.358	-0.030	-4.575	11564	1210	30	1302	10.1
12							-3.336	-0.051	-4.592	11524	1203	28	1298	10.1
214- 1			-9.6	8.06	10.92	2.97	-4.000	-2.000	-5.000	12741	1343	-208	1431	11.4
2							-4.500	-1.500	-4.600	13428	1485	-144	1503	11.9
3							-4.900	-2.300	-5.400	15649	920	-145	1483	17.6
4							-5.300	-2.700	-5.800	16148	355	-124	1465	24.4
5							-5.692	-0.724	-3.489	14425	1781	47	1655	13.0
6							-5.551	-0.372	-3.572	14281	1755	31	1636	12.8
7							-4.891	-1.243	-3.560	13597	1658	63	1558	11.8
8							-2.697	-4.071	-4.179	11109	1121	64	1288	9.5
9							-3.034	-3.573	-4.211	11430	1186	31	1320	9.8
10							-3.100	-3.484	-4.204	11601	1200	28	1327	9.9
11							-3.096	-3.492	-4.201	11604	1200	29	1327	9.9
12							-3.096	-3.492	-4.203	11499	1200	29	1327	9.9

TABLE XIII - Continued

CASE NO.	μ	θ_x (deg)	α_F (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	P HP	n_{max} (deg)
215- 1	.3	-4.0	-9.5	13.39	3.60	3.34	1.000	1.100	-2.000	11517	1203	28	1354	9.5
2							1.400	1.600	-1.500	7186	671	40	1161	7.9
3							1.800	2.000	-2.500	4912	211	1	1008	6.2
4							2.200	2.400	-1.000	-289	-1131	294	652	7.3
5							1.002	1.102	-2.000	11499	1201	28	1353	9.5
6							1.001	1.101	-1.997	11511	1204	28	1354	9.5
7							1.001	1.100	-1.995	11505	1202	29	1354	9.5
216- 1				7.66	6.04	1.87	-4.000	1.000	-2.000	10658	1087	-13	1241	8.8
2							-4.300	1.500	-2.300	11113	1138	-93	1271	9.4
3							-4.600	2.000	-2.600	11662	1186	-179	1302	10.1
4							-4.900	2.300	-1.700	11377	1294	-40	1340	10.0
5							-4.362	1.631	-2.530	11310	1142	-141	1277	9.7
6							-3.872	0.853	-2.249	10656	1050	-43	1227	8.5
7							-4.127	1.182	-2.093	10889	1113	-37	1256	9.1
8							-4.394	1.280	-1.681	11436	1207	43	1302	9.4
9							-4.372	1.250	-1.786	11496	1198	28	1300	9.4
217- 1				9.06	8.80	2.88	-3.000	-1.000	-4.000	12833	1357	-102	1385	10.5
2							-2.700	-1.300	-3.600	11921	1311	-27	1341	9.6
3							-3.300	-1.600	-4.400	15335	1291	-24	1448	12.3
4							-3.800	-2.000	-4.800	16663	709	-36	1395	16.3
5							-2.531	-1.595	-3.367	11724	1293	32	1328	9.3
6							-2.558	-1.615	-3.333	11773	1299	41	1331	9.3
7							-2.541	-1.638	-3.347	11757	1293	40	1329	9.3
8							-2.211	-2.111	-3.568	11526	1202	29	1292	9.1
218- 1	.3	-4.0	-9.5	12.68	2.22	1.44	1.000	1.100	0.100	9869	908	80	1274	6.8
2							1.500	1.800	0.800	3888	-40	56	924	6.5
3							2.000	2.400	1.000	-1003	-1478	226	643	6.8
4							2.400	2.800	1.500	-5062	-2888	418	270	7.1
5							0.659	0.428	1.969	11829	1338	558	1415	5.9
6							0.653	0.415	2.028	11819	1339	570	1416	5.8
7							0.964	1.101	-0.486	10749	1019	2	1291	7.4
8							0.885	0.984	-0.390	11460	1092	44	1319	7.5
9							1.040	1.173	-0.598	10,93	950	-29	1265	7.4
10							0.733	1.171	-0.088	11420	1135	83	1337	7.3
11							0.752	1.138	-0.090	11423	1133	85	1336	7.3
12							0.241	1.984	-0.035	11641	1228	30	1381	7.5
13							0.372	1.889	-0.073	11510	1202	28	1370	7.5
14							0.323	1.887	-0.070	11521	1204	28	1371	7.5
219- 1				14.92	1.16	4.74	2.000	3.000	-2.100	9496	897	84	1344	11.8
2							2.500	2.700	-1.800	7284	543	135	1214	11.1
3							2.900	3.300	-2.400	4244	-78	135	1018	11.3
4							3.400	3.800	-2.900	1257	-824	284	810	11.5
5							1.507	3.410	-2.510	11450	1141	-3	1444	12.6
6							1.594	3.085	-2.185	11562	1163	79	1446	12.4
7							1.579	3.103	-2.203	11615	1169	75	1448	12.4
8							1.564	3.104	-2.264	11586	1164	59	1447	12.5
9							1.947	2.220	-1.310	11218	1144	293	1427	11.4
10							1.299	3.486	-2.770	12606	1241	-55	1488	13.4
11							1.398	3.571	-2.420	11479	1166	0	1455	12.7
12							1.275	3.765	-2.126	11517	1218	38	1474	12.5
13							1.285	3.691	-2.210	11509	1202	28	1469	12.6
220-1	.3	-4.0	-9.6	10.07	7.24	2.40	-1.379	-1.349	-2.529	11960	1253	66	1303	8.5
2							-1.500	-1.600	-2.700	13179	1283	99	1338	9.3
3							-1.700	-1.000	-2.300	12446	1354	98	1348	8.8
4							-1.000	-1.700	-2.100	10657	1155	124	1247	7.4
5							-1.214	-1.420	-2.667	11508	1196	32	1275	8.2
6							-1.226	-1.388	-2.671	11493	1197	28	1275	8.2
221-1				9.33	4.14	1.65	-3.100	2.200	-0.760	12663	1334	66	1349	9.3
2							-2.800	1.900	-1.000	12248	1249	30	1308	8.9
3							-3.300	1.600	-0.500	14635	1407	278	1417	10.2
4							-3.600	1.300	-1.300	17019	1276	293	1445	11.9
5							-2.394	1.489	-1.009	11376	1148	35	1254	8.1
6							-2.537	1.693	-0.938	11454	1176	34	1267	8.2
7							-2.653	1.885	-0.889	11616	1203	29	1279	8.4
8							-2.634	1.860	-0.899	11498	1199	29	1277	

TABLE XIV . LIST OF COMPUTER RUNS FOR THE CTR-A3 CONFIGURATION. V = 120 KTS

CASE NO.	μ	θ_x (deg)	α_r (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	P HP	α_{max} (deg)
301-1	.3	-8.0	9.5	10.018	3.443	-1.488	1.500	-1.000	1.000	3093	-216	-59.6	802.5	4.20
2							1.200	-1.300	1.300	5401	206	-34.3	948.6	3.97
3							1.800	-0.750	1.600	-389	-1058	-32.5	570.9	4.62
4							2.100	-1.600	0.750	1756	-493	-46.5	710.2	4.26
5							-0.810	-0.305	3.344	10938	1137	373.2	1339.0	5.22
6							-1.274	0.384	3.604	10974	1223	361.6	1377.3	5.07
7							0.215	-1.105	2.114	9120	780	137.1	1177.2	4.40
8							-0.168	-1.058	1.941	11175	984	203.1	1260.8	5.60
9							-1.475	1.317	1.878	11644	1217	10.4	1353.1	5.65
10							-1.402	1.192	1.963	11513	1202	32.3	1347.3	5.50
11							-1.397	1.192	1.950	11502	1200	29.6	1346.3	5.50
12							-1.390	1.192	1.946	11489	1198	20.0	1345	5.49
302-1	.3	-6.0	9.5	7.79	9.16	.345	-4.000	-1.430	-1.130	13579	1436	115.1	1440.3	9.38
2							-4.080	-2.180	-1.500	13394	1300	94.0	1385.9	9.13
3							-4.000	-2.300	-1.550	13362	1279	92.7	1377.7	9.16
4							-3.940	-2.390	-1.548	13313	1268	98.4	1372.3	9.12
5							-2.247	-3.530	-1.067	8547	800	9.0	1118.8	5.60
6							-3.815	-1.926	-1.414	11061	1228	19.2	1322.5	8.01
7							-3.678	-2.113	-1.412	11493	1198	28.8	1308.3	7.83
303-1	.3	-8.0	9.5	10.072	7.842	2.402	-1.000	-1.300	-1.500	10709	1208	190.8	1282.9	7.22
2							-0.750	-1.600	-1.200	9902	1123	227.3	1246.2	6.40
3							-0.500	-1.000	-0.900	6861	744	132.5	1086.5	6.40
4							-1.300	-0.750	-1.000	10305	1253	215.4	1297.5	6.68
5							-1.313	-0.584	-2.471	11513	1251	-9.3	1305.5	8.71
6							-0.922	-1.324	-2.550	11438	1167	36.7	1275.2	8.64
7							-1.044	-1.117	-2.507	11496	1197	29.4	1286.2	8.65
8							-1.056	-1.099	-2.502	11503	1200	28.9	1287.5	8.65

TABLE XIV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA	ALFA MAX RAD	AZM
3000-C1- 1	16335.1	1532.8	-5.9	9.692	5.268	1.154	-3.291	1.782	-1.349	1516.0	11.020	0.450	210.0
3000-C1- 2	17552.3	1153.1	42.8	9.200	3.500	0.800	-3.291	1.782	-1.349	1409.7	11.771	0.400	210.0
3000-C1- 3	17795.8	1217.6	-132.0	9.400	4.000	0.200	-3.291	1.782	-1.349	1446.2	11.944	0.400	210.0
3000-C1- 4	18351.3	1237.0	-461.7	9.600	4.500	-1.000	-3.291	1.782	-1.349	1488.1	12.435	0.500	225.0
3000-C1- 5	12310.4	1047.5	-75.8	8.072	4.114	1.000	-3.291	1.782	-1.349	1257.6	8.253	.000	270.0
3000-C1- 6	11405.2	1091.7	5.2	8.185	4.672	1.633	-3.291	1.782	-1.349	1260.5	7.899	.000	270.0
3000-C1- 7	11525.6	1187.2	26.7	8.454	5.141	1.854	-3.291	1.782	-1.349	1296.2	8.078	.000	270.0
3000-C1- 8	11488.9	1196.8	29.7	8.486	5.219	1.891	-3.291	1.782	-1.349	1299.2	8.074	.000	270.0
3000-C1- 9	11500.3	1200.7	29.1	8.497	5.237	1.890	-3.291	1.782	-1.349	1300.7	8.085	.000	270.0
3000-C2- 1	9747.6	1014.9	42.3	8.938	5.627	-1.150	-1.591	-0.671	1.227	1232.2	4.825	.720	315.0
3000-C2- 2	13151.4	1127.4	622.5	9.200	3.500	0.900	-1.591	-0.671	1.227	1316.4	6.623	.650	225.0
3000-C2- 3	13497.6	1204.9	498.9	9.400	4.000	0.200	-1.591	-0.671	1.227	1346.1	6.863	.650	225.0
3000-C2- 4	14303.0	1277.7	758.9	9.600	4.500	-1.000	-1.591	-0.671	1.227	1382.9	7.444	.682	315.0
3000-C2- 5	11568.7	1241.8	11.4	9.404	5.831	-1.508	-1.591	-0.671	1.227	1332.8	5.892	.720	315.0
3000-C2- 6	11504.4	1214.2	27.1	9.334	5.679	-1.450	-1.591	-0.671	1.227	1322.5	5.846	.720	315.0
3000-C2- 7	11499.9	1185.7	33.1	9.253	5.499	-1.463	-1.591	-0.671	1.227	1312.7	5.845	.720	315.0
3000-C2- 8	11506.3	1201.3	28.9	9.293	5.593	-1.461	-1.591	-0.671	1.227	1318.1	5.850	.720	315.0
3000-C3- 1	16675.5	1387.1	275.1	9.448	5.978	0.906	-2.628	-0.550	-1.057	1664.2	10.809	.500	225.0
3000-C3- 2	19531.9	800.9	553.3	9.200	3.500	0.900	-2.628	-0.550	-1.057	1339.9	13.521	.400	225.0
3000-C3- 3	19654.5	822.6	354.4	9.400	4.000	0.200	-2.628	-0.550	-1.057	1369.8	14.352	.400	225.0
3000-C3- 4	19953.2	751.5	-42.4	9.600	4.500	-1.000	-2.628	-0.550	-1.057	1374.5	15.113	.400	225.0
3000-C3- 5	10505.2	791.4	302.4	7.359	4.405	1.983	-2.628	-0.550	-1.057	1144.8	6.485	.900	210.0
3000-C3- 6	11581.3	1096.2	145.1	8.212	6.094	1.226	-2.628	-0.550	-1.057	1265.5	7.273	.500	210.0
3000-C3- 7	11421.7	1205.0	24.0	8.515	7.046	0.775	-2.628	-0.550	-1.057	1303.2	7.197	.500	210.0
3000-C3- 8	11529.5	1208.6	28.5	8.519	6.995	0.778	-2.628	-0.550	-1.057	1306.0	7.263	.500	210.0
3000-C3- 9	11537.0	1199.8	30.5	8.490	6.939	0.783	-2.628	-0.550	-1.057	1302.7	7.269	.500	210.0
3000-C3-10	11505.9	1200.4	28.8	8.493	6.964	0.782	-2.628	-0.550	-1.057	1302.5	7.252	.500	210.0
3000-C4- 1	17421.8	1543.9	-45.7	9.800	4.261	0.682	-3.716	2.838	-0.845	1563.0	11.608	.890	255.0
3000-C4- 2	16516.2	1341.2	-8.1	9.200	3.500	0.930	-3.716	2.839	-0.845	1465.0	10.955	.890	255.0
3000-C4- 3	16756.3	1431.6	-176.1	9.400	4.000	0.290	-3.716	2.838	-0.845	1501.1	11.114	.890	255.0
3000-C4- 4	17339.5	1463.6	-497.4	9.600	4.500	-1.000	-3.716	2.839	-0.845	1540.7	11.451	.890	255.0
3000-C4- 5	10735.6	945.0	-22.2	7.587	3.218	1.211	-3.716	2.838	-0.845	1207.0	7.658	0.970	255.0
3000-C4- 6	11866.2	1240.9	-4.4	8.410	4.344	1.498	-3.716	2.839	-0.845	1327.8	8.491	1.000	255.0
3000-C4- 7	11470.5	1185.9	20.5	8.272	4.208	1.637	-3.716	2.848	-0.845	1302.6	8.266	1.000	255.0
3000-C4- 8	11500.7	1202.1	29.3	8.319	4.273	1.699	-3.716	2.838	-0.845	1308.9	8.299	1.000	255.0
3000-C5- 1	13957.9	1557.0	560.7	9.506	2.855	1.510	-3.347	3.024	1.569	1496.3	9.054	0.890	240.0
3000-C5- 2	12157.9	1437.8	296.7	9.200	3.500	0.900	-3.347	3.024	1.569	1427.1	8.019	0.890	240.0
3000-C5- 3	12493.5	1524.3	170.0	9.400	4.000	0.200	-3.347	3.024	1.569	1461.6	8.193	0.890	240.0
3000-C5- 4	13190.6	1622.3	-73.6	9.600	4.500	-1.000	-3.347	3.024	1.569	1597.0	8.500	0.890	240.0
3000-C5- 5	11546.5	1188.7	109.2	8.539	2.719	-0.293	-3.347	3.024	1.569	1331.5	7.504	0.890	240.0
3000-C5- 6	11494.5	1199.9	26.7	8.561	2.957	-0.692	-3.347	3.024	1.569	1333.8	7.451	0.890	240.0
3000-C5- 7	11504.8	1200.9	29.2	8.561	2.950	-0.691	-3.347	3.024	1.569	1334.3	7.458	0.890	240.0
3000-C6- 1	12108.6	1278.4	40.4	11.490	4.265	1.533	-0.382	1.013	-0.676	1366.6	8.260	0.400	195.0
3000-C6- 2	12783.8	1371.2	-24.2	11.700	4.500	1.200	-0.382	1.013	-0.676	1407.7	8.650	0.400	195.0
3000-C6- 3	9609.2	1023.8	-84.5	11.000	4.800	1.000	-0.382	1.013	-0.676	1245.6	6.704	.400	180.0
3000-C6- 4	9343.7	906.6	64.4	10.700	3.900	1.800	-0.382	1.013	-0.676	1205.6	6.742	.350	180.0
3000-C6- 5	11499.1	1206.8	29.1	11.328	4.245	1.512	-0.382	1.013	-0.676	1334.1	7.855	.400	195.0
3000-C7- 1	12192.3	1269.4	53.7	11.319	6.111	-0.179	0.316	-1.666	-0.022	1343.1	6.969	0.500	210.0
3000-C7- 2	13373.6	1389.9	5.6	11.700	6.400	-0.400	0.316	-1.666	-0.022	1405.4	7.952	0.450	210.0
3000-C7- 3	11890.2	1171.8	-65.1	11.000	5.800	-0.700	0.316	-1.666	-0.022	1302.7	6.600	0.500	210.0
3000-C7- 4	10598.4	1053.3	113.4	10.700	5.500	0.300	0.316	-1.666	-0.022	1243.8	5.688	0.450	195.0
3000-C7- 5	11569.7	1191.6	15.0	11.052	5.966	-0.297	0.316	-1.666	-0.022	1304.1	6.396	0.500	210.0
3000-C7- 6	11495.7	1198.3	28.3	11.073	6.023	-0.188	0.316	-1.666	-0.022	1305.2	6.352	0.500	210.0
3000-C7- 7	11492.8	1199.0	28.9	11.080	6.032	-0.181	0.316	-1.666	-0.022	1305.4	6.353	0.500	210.0

TABLE XIV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
3000-CA- 1	11636.8	1727.9	43.9	11.155	5.053	-2.404	0.461	-1.651	2.227	1357.1	5.972	0.650	330.0
3000-CA- 2	13106.3	1409.9	149.5	11.700	5.300	-2.100	0.461	-1.651	2.227	1445.1	7.040	0.650	330.0
3000-CA- 3	8987.3	948.0	-67.5	10.700	5.600	-2.700	0.461	-1.651	2.227	1226.1	4.911	0.650	330.0
3000-CA- 4	8843.5	846.2	55.4	10.400	4.700	-2.000	0.461	-1.651	2.227	1193.3	4.433	0.650	330.0
3000-CA- 5	11488.2	1177.1	37.5	11.019	4.843	-2.554	0.461	-1.651	2.227	1337.9	5.903	0.650	330.0
3000-CA- 6	11530.7	1188.9	32.9	11.045	4.913	-2.563	0.461	-1.651	2.227	1342.0	5.911	0.650	330.0
3000-CA- 7	11441.7	1196.0	28.8	11.073	4.982	-2.565	0.461	-1.651	2.227	1344.1	5.891	0.650	330.0
3000-C9- 1	10517.2	1116.7	9.5	11.224	2.553	-2.309	-0.147	1.037	2.964	1372.5	5.514	0.200	105.0
3000-C9- 2	12363.6	1271.6	121.0	11.500	2.700	-2.000	-0.147	1.037	2.964	1444.2	5.946	0.200	105.0
3000-C9- 3	14340.4	1380.6	83.1	11.800	1.939	-2.600	-0.147	1.037	2.964	1508.9	6.748	0.650	330.0
3000-C9- 4	8865.3	850.1	43.2	10.900	2.800	-1.700	-0.147	1.037	2.964	1259.5	5.267	0.200	105.0
3000-C9- 5	11506.3	1169.2	25.1	11.337	2.439	-2.337	-0.147	1.037	2.964	1405.2	5.646	0.200	105.0
3000-C9- 6	11488.7	1189.6	30.0	11.337	2.443	-2.306	-0.147	1.037	2.964	1405.2	5.649	0.200	105.0
3000-C9- 7	11461.5	1190.1	30.6	11.365	2.468	-2.291	-0.147	1.037	2.964	1405.0	5.641	0.200	105.0
3000-C9- 8	11507.5	1200.9	29.2	11.376	2.508	-2.296	-0.147	1.037	2.964	1409.0	5.634	0.200	105.0
3000-CA- 1	11127.1	1155.0	14.0	11.422	2.368	0.152	-0.595	2.358	1.080	1378.9	7.153	0.300	165.0
3000-CA- 2	9043.7	913.3	18.4	11.100	2.000	0.400	-0.595	2.358	1.080	1272.2	6.929	0.300	150.0
3000-CA- 3	9550.5	878.0	-71.3	10.800	2.300	-0.400	-0.595	2.358	1.080	1265.3	6.497	0.300	150.0
3000-CA- 4	13017.6	1335.7	187.2	11.700	1.700	0.700	-0.595	2.358	1.080	1455.2	8.169	0.300	165.0
3000-CA- 5	11519.5	1201.8	28.4	11.498	2.306	0.169	-0.595	2.358	1.080	1400.0	7.340	0.300	165.0
3000-CA- 6	11487.8	1198.5	29.1	11.497	2.314	0.197	-0.595	2.358	1.080	1398.5	7.330	0.300	165.0
3000-CB- 1	10242.1	968.1	90.3	10.925	4.353	2.239	-0.080	0.180	-1.453	1218.6	7.598	0.330	180.0
3000-CB- 2	9235.4	757.3	96.1	10.500	4.700	2.600	-0.080	0.180	-1.453	1123.2	6.502	0.350	180.0
3000-CB- 3	7937.8	681.4	151.1	10.200	4.000	2.900	-0.080	0.180	-1.453	1090.9	6.438	0.350	180.0
3000-CB- 4	12278.2	1055.7	55.7	11.000	3.830	1.800	-0.080	0.180	-1.453	1273.6	8.799	0.400	195.0
3000-CB- 5	11555.8	1185.0	0.8	11.354	5.054	1.959	-0.080	0.180	-1.453	1307.2	8.429	0.400	195.0
3000-CB- 6	11526.8	1173.1	28.9	11.324	4.969	1.946	-0.080	0.180	-1.453	1301.0	8.420	0.400	195.0
3000-CB- 7	11492.6	1195.8	29.0	11.396	5.121	2.030	-0.080	0.180	-1.453	1310.3	8.472	0.400	195.0
3000-CC- 1	8466.0	860.5	-290.0	10.547	6.736	-0.561	0.184	-0.596	-1.299	1139.0	5.465	0.400	135.0
3000-CC- 2	6835.4	584.1	-187.4	10.000	6.300	-0.200	0.184	-0.896	-1.299	1025.5	4.469	0.400	180.0
3000-CC- 3	10793.2	1039.6	-340.2	10.800	6.000	-0.703	0.184	-0.996	-1.219	1229.8	6.979	0.403	195.0
3000-CC- 4	12268.9	1012.0	-608.0	11.000	5.703	-1.093	0.184	-0.898	-1.239	1275.6	8.037	0.450	210.0
3000-CC- 5	11633.5	753.5	133.0	10.016	2.974	1.317	0.184	-0.896	-1.299	1146.3	7.554	0.400	195.0
3000-CC- 6	11418.2	863.4	80.7	10.335	3.762	1.225	0.184	-0.896	-1.239	1183.0	7.601	0.400	195.0
3000-CC- 7	11652.9	1210.2	29.7	11.338	5.967	1.449	0.184	-0.896	-1.299	1303.1	7.928	0.400	195.0
3000-CC- 8	11531.7	1199.2	27.1	11.398	5.921	1.457	0.184	-0.896	-1.299	1299.5	7.990	0.400	195.0
3000-CC- 9	11445.0	1199.1	29.1	11.310	5.926	1.444	0.184	-0.896	-1.299	1299.4	7.891	0.400	195.0
3000-CE- 1	19113.4	530.1	-935.6	10.471	2.075	-2.826	-0.872	0.596	-1.476	1236.8	13.592	0.350	210.0
3000-CE- 2	16665.7	704.8	-810.2	10.000	2.400	-2.990	-0.872	0.596	-1.476	1212.2	11.326	0.400	210.0
3000-CE- 3	14252.5	776.8	-741.4	10.600	2.700	-2.200	-0.872	0.596	-1.476	1283.9	12.611	0.350	210.0
3000-CE- 4	20335.4	536.2	-632.7	11.000	1.800	-1.700	-0.872	0.596	-1.476	1261.1	16.077	0.300	210.0
3000-CE- 5	11526.0	930.9	-202.3	9.864	3.855	0.421	-0.872	0.596	-1.476	1305.4	7.866	0.400	195.0
3000-CE- 6	11479.7	1163.1	-7.2	10.966	4.994	1.932	-0.872	0.596	-1.476	1287.3	8.157	0.400	195.0
3000-CE- 7	11515.6	1204.9	27.3	10.667	5.158	2.035	-0.872	0.596	-1.476	1302.6	8.239	0.400	195.0
3000-CE- 8	11535.6	1191.2	24.9	10.630	5.099	2.009	-0.872	0.596	-1.476	1297.4	8.205	0.400	195.0
3000-CE- 9	11534.2	1209.7	29.0	10.654	5.136	2.040	-0.872	0.596	-1.476	1301.0	8.224	0.400	195.0
3000-CF- 1	20259.0	366.6	70.2	10.695	1.242	-0.185	-0.607	-0.490	-1.322	1199.5	15.758	0.300	210.0
3000-CF- 2	17614.8	542.6	-34.7	10.000	1.600	-0.400	-0.607	-0.490	-1.322	1168.1	12.252	0.350	210.0
3000-CF- 3	20420.3	359.4	-111.9	11.000	1.500	-0.700	-0.607	-0.490	-1.322	1213.9	16.042	0.300	210.0
3000-CF- 4	17410.4	737.0	126.1	10.300	2.200	0.400	-0.607	-0.490	-1.322	1227.1	11.889	0.350	210.0
3000-CF- 5	9852.0	562.8	-27.3	8.706	2.856	0.474	-0.607	-0.480	-1.322	1051.5	6.228	0.400	195.0
3000-CF- 6	10210.2	672.7	-20.0	8.994	3.263	0.611	-0.607	-0.480	-1.322	1096.2	6.534	0.400	195.0
3000-CF- 7	11460.4	1175.9	[illegible]	10.937	5.771	1.530	-0.607	-0.480	-1.322	1243.1	7.667	0.400	195.0
3000-CF- 8	11473.6	1193.5	[illegible]	10.560	5.881	1.512	-0.607	-0.480	-1.322	1284.4	7.686	0.400	195.0
3000-CF- 9	11510.8	1204.7	[illegible]	10.584	5.932	1.494	-0.607	-0.480	-1.322	1293.7	7.725	0.400	195.0
3000-CF-10	11496.9	1196.9	28.5	10.570	5.913	1.486	-0.607	-0.480	-1.322	1291.4	7.692	0.400	195.0

TABLE XIV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	C1S	C1C	HP	ALFA MAX ALFA	RAD	AZM
3010-W1- 1	10330.2	1044.0	-5.0	14.820	4.368	-0.407	3.957	-2.168	0.706	1373.8	8.056	0.200	135.0
3010-W1- 2	9337.4	779.5	3.2	14.500	4.600	-0.100	3.957	-2.168	0.706	1263.6	7.877	0.200	120.0
3010-W1- 3	7261.0	692.1	28.5	14.300	4.600	0.200	3.957	-2.168	0.706	1193.2	7.556	0.200	120.0
3010-W1- 4	12216.1	1235.0	-12.8	15.100	4.000	-0.700	3.957	-2.168	0.706	1457.0	8.578	0.300	150.0
3010-W1- 5	11501.5	1179.9	40.2	15.020	4.024	-0.209	3.957	-2.168	0.706	1431.7	8.545	0.200	135.0
3010-W1- 6	11462.4	1178.0	28.2	15.026	4.133	-0.356	3.957	-2.168	0.706	1429.1	8.450	0.200	135.0
3010-W1- 7	11520.5	1196.9	31.1	15.075	4.217	-0.323	3.957	-2.168	0.706	1435.8	8.466	0.300	150.0
3010-W1- 8	11495.3	1199.0	28.8	15.087	4.256	-0.323	3.957	-2.168	0.706	1436.0	8.455	0.300	150.0
3010-W2- 1	11709.5	1240.2	41.8	14.866	7.575	1.125	4.456	-4.752	-1.637	1353.7	8.773	0.350	195.0
3010-W2- 2	10335.1	1067.2	-35.2	14.500	7.700	0.830	4.456	-4.752	-1.637	1284.8	7.834	0.300	180.0
3010-W2- 3	9385.5	978.0	-90.1	14.300	7.900	0.500	4.456	-4.752	-1.637	1236.9	7.122	0.350	180.0
3010-W2- 4	12773.0	1290.3	121.8	15.100	7.200	1.400	4.456	-4.752	-1.637	1390.9	9.731	0.300	195.0
3010-W2- 5	11734.4	1278.6	-20.5	14.960	7.858	0.465	4.456	-4.752	-1.637	1367.0	8.769	0.350	195.0
3010-W2- 6	11566.6	1223.9	22.7	14.808	7.587	1.041	4.456	-4.752	-1.637	1345.5	8.659	0.350	195.0
3010-W2- 7	11431.8	1169.8	30.3	14.720	7.451	1.060	4.456	-4.752	-1.637	1332.6	8.566	0.300	180.0
3010-W2- 8	11540.9	1205.4	28.8	14.762	7.483	1.051	4.456	-4.752	-1.637	1339.3	8.643	0.350	195.0
3010-W4-12	11829.2	1232.6	42.6	14.963	13.990	4.189	5.653	-9.918	-6.322	1365.4	14.997	0.400	225.0
3010-W4-13	9931.6	1094.7	-5.9	14.900	14.200	3.900	5.653	-9.918	-6.322	1295.2	12.653	0.400	225.0
3010-W4-14	9168.1	1014.0	-59.6	14.300	14.600	3.500	5.653	-9.918	-6.322	1267.6	11.998	0.400	225.0
3010-W4-15	12826.7	1265.1	119.1	15.100	13.600	4.600	5.653	-9.918	-6.322	1392.3	15.937	0.400	225.0
3010-W4-16	11494.1	1224.4	24.6	14.856	14.060	4.086	5.653	-9.918	-6.322	1357.7	14.415	0.400	225.0
3010-W4-17	11517.2	1239.8	36.7	14.903	14.106	4.172	5.653	-9.918	-6.322	1363.2	14.445	0.400	225.0
3010-W4-18	11590.1	1142.9	-8.4	14.623	13.565	3.774	5.653	-9.918	-6.322	1333.3	14.576	0.400	225.0
3010-W4-19	11521.7	1197.4	28.0	14.778	13.858	4.097	5.653	-9.918	-6.322	1348.1	14.466	0.400	225.0
3010-W4-20	11497.6	1199.1	28.7	14.782	13.877	4.067	5.653	-9.918	-6.322	1348.4	14.440	0.400	225.0
3010-W4-21	11494.3	1199.3	29.0	14.784	13.881	4.073	5.653	-9.918	-6.322	1349.4	14.436	0.400	225.0
3010-W5- 1	11839.3	1225.1	33.4	11.343	7.789	1.277	0.538	-2.789	-1.763	1311.5	8.326	0.450	210.0
3010-W5- 2	13249.2	1283.9	124.5	11.600	7.400	1.500	0.538	-2.789	-1.763	1356.2	9.660	0.400	210.0
3010-W5- 3	14316.0	1305.6	216.5	11.800	7.100	1.700	0.538	-2.789	-1.763	1384.8	10.618	0.400	210.0
3010-W5- 4	13834.4	1145.7	-53.0	11.100	8.030	0.900	0.538	-2.789	-1.763	1257.9	7.473	0.450	210.0
3010-W5- 5	11493.2	1206.8	21.5	11.293	7.886	1.273	0.538	-2.789	-1.763	1293.8	8.070	0.450	210.0
3010-W5- 6	11495.4	1209.7	27.6	11.299	7.879	1.299	0.538	-2.789	-1.763	1303.7	8.067	0.450	210.0
3010-W5- 7	12184.6	1100.8	-108.7	10.982	7.136	0.731	0.538	-2.789	-1.763	1274.9	8.499	0.400	210.0
3010-W5- 8	11551.9	1198.6	25.5	11.263	7.782	1.257	0.538	-2.789	-1.763	1291.3	8.076	0.450	210.0
3010-W5- 9	11511.5	1199.9	28.2	11.266	7.805	1.283	0.538	-2.789	-1.763	1297.6	8.067	0.450	210.0
3010-W5-10	11494.1	1199.1	29.0	11.266	7.813	1.290	0.538	-2.789	-1.763	1299.9	8.037	0.450	210.0
3010-Y1- 1	13214.2	1351.6	11.8	16.938	4.122	-0.396	3.895	-1.906	0.778	1377.5	8.297	0.200	120.0
3010-Y1- 2	8516.6	792.4	-56.8	14.500	4.400	-0.670	3.895	-1.906	0.778	1272.2	7.186	0.200	120.0
3010-Y1- 3	11676.6	1193.2	113.8	15.100	3.800	0.150	3.895	-1.906	0.778	1439.4	8.887	0.200	135.0
3010-Y1- 4	7391.5	670.3	-107.6	14.300	4.700	-0.450	3.895	-1.906	0.778	1201.5	7.342	0.200	120.0
3010-Y1- 5	11673.7	1192.3	28.6	15.110	3.595	-0.259	3.895	-1.906	0.778	1441.6	8.649	0.200	135.0
3010-Y1- 6	11536.1	1196.6	33.3	15.129	3.572	-0.272	3.895	-1.906	0.778	1442.7	8.709	0.200	135.0
3010-Y1- 7	11525.9	1204.6	29.9	15.133	4.022	-0.240	3.895	-1.906	0.778	1446.3	8.698	0.200	135.0
3010-Y1- 8	11167.7	1156.7	31.5	15.176	4.019	-0.244	3.895	-1.906	0.778	142 6	8.571	0.200	135.0
3010-Y1- 9	11493.7	1198.3	28.7	15.127	4.019	-0.255	3.895	-1.906	0.778	1443.9	8.632	0.200	135.0
3010-Y1-10	11513.0	1202.4	29.2	15.136	4.026	-0.242	3.895	-1.906	0.778	1445.6	8.694	0.200	135.0

TABLE XIV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
3010-K1- 1	9973.6	1002.2	-2.0	14.550	4.570	0.972	3.903	-1.804	-0.442	1347.1	8.948	0.300	165.0
3010-K1- 2	9027.3	825.3	36.8	14.600	4.200	1.230	3.903	-1.804	-0.442	1280.3	8.709	0.300	150.0
3010-K1- 3	7172.3	557.1	-57.7	14.300	4.800	0.690	3.903	-1.804	-0.442	1173.0	7.874	0.300	150.0
3010-K1- 4	6079.9	457.6	65.3	14.000	3.900	1.500	3.903	-1.804	-0.442	1142.3	8.214	0.200	135.0
3010-K1- 5	10667.6	865.5	-183.7	14.336	3.245	-0.590	3.903	-1.804	-0.442	1307.3	8.809	0.300	165.0
3010-K1- 6	11484.5	1150.9	60.6	15.162	4.123	1.144	3.903	-1.804	-0.442	1415.6	9.676	0.300	165.0
3010-K1- 7	11545.1	1196.1	25.7	15.294	4.473	1.030	3.903	-1.804	-0.442	1429.8	9.631	0.300	165.0
3010-K1- 8	11511.2	1202.5	25.3	15.305	4.481	1.051	3.903	-1.804	-0.442	1432.2	9.645	0.300	165.0
3010-K2- 1	11154.0	1155.1	35.3	14.575	7.786	2.704	4.425	-4.397	-2.962	1328.1	10.468	0.300	195.0
3010-K2- 2	10300.5	1026.0	77.7	14.600	7.400	2.900	4.425	-4.397	-2.962	1271.6	9.853	0.300	180.0
3010-K2- 3	9425.7	894.2	121.8	14.300	7.100	3.200	4.425	-4.397	-2.962	1218.9	9.380	0.300	180.0
3010-K2- 4	7314.8	674.3	-12.6	14.000	8.000	2.400	4.425	-4.397	-2.962	1121.9	7.825	0.300	180.0
3010-K2- 5	11320.8	1141.4	21.3	14.551	7.664	2.555	4.425	-4.397	-2.962	1376.8	10.552	0.300	195.0
3010-K2- 6	11512.1	1205.2	36.0	15.231	8.009	2.712	4.425	-4.397	-2.962	[illegible]	10.768	0.300	195.0
3010-K2- 7	11536.9	1159.9	28.3	15.149	7.940	2.657	4.425	-4.397	-2.962	1349.0	10.716	0.300	195.0
3010-K2- 8	11515.4	1202.4	25.2	15.192	8.002	2.671	4.425	-4.397	-2.962	1354.6	10.766	0.300	195.0
3010-K3- 1	11245.4	1131.0	65.4	15.002	10.555	4.435	4.947	-6.991	-5.481	1324.3	13.323	0.350	210.0
3010-K3- 2	10589.1	1052.6	121.2	14.700	10.600	4.700	4.947	-6.991	-5.481	1281.0	12.715	0.350	210.0
3010-K3- 3	9835.6	968.1	158.6	14.400	10.300	4.900	4.947	-6.991	-5.481	1235.7	12.040	0.300	195.0
3010-K3- 4	12296.3	1233.8	-24.4	15.300	11.200	4.000	4.947	-6.991	-5.481	1371.5	14.357	0.350	210.0
3010-K3- 5	11640.5	1201.0	27.5	15.160	11.267	4.278	4.947	-6.991	-5.481	1346.5	13.539	0.350	210.0
3010-K3- 6	11692.4	1198.9	28.9	15.156	11.256	4.283	4.947	-6.991	-5.481	1345.6	13.538	0.350	210.0
3010-K4- 1	10948.9	1120.2	61.2	15.028	14.211	6.167	5.469	-9.585	-8.031	1335.5	16.980	0.300	210.0
3010-K4- 2	10216.3	1039.6	91.4	14.700	14.000	6.300	5.469	-9.585	-8.031	1294.9	16.050	0.300	210.0
3010-K4- 3	9255.7	942.6	15.1	14.400	14.300	5.900	5.469	-9.585	-8.031	1251.2	15.223	0.300	210.0
3010-K4- 4	11576.2	1194.9	-96.2	15.300	14.600	5.700	5.469	-9.585	-8.031	1376.3	17.509	0.300	210.0
3010-K4- 5	11536.9	1137.7	42.3	15.145	14.687	6.028	5.469	-9.585	-8.031	1352.8	17.073	0.300	210.0
3010-K4- 6	11637.5	1203.4	26.7	15.335	14.496	6.040	5.469	-9.585	-8.031	1378.7	17.803	0.300	210.0
3010-K4- 7	11571.7	1199.4	25.3	15.314	14.516	6.058	5.469	-9.585	-8.001	1375.3	17.653	0.300	210.0
3010-K4- 8	11676.5	1199.3	25.1	15.316	14.520	6.057	5.469	-9.585	-8.031	1375.2	17.646	0.300	210.0
3010-K5- 1	11447.1	1186.5	28.8	11.371	7.854	2.051	0.561	-2.614	-2.417	1289.6	8.836	0.400	210.0
3010-K5- 2	10519.9	1055.1	56.6	11.000	7.900	2.200	0.561	-2.614	-2.417	1235.2	7.986	0.400	210.0
3010-K5- 3	12875.4	1243.8	106.6	11.600	7.300	2.500	0.561	-2.614	-2.417	1331.2	10.134	0.400	210.0
3010-K5- 4	13034.5	1358.2	17.3	11.500	8.100	1.900	0.561	-2.614	-2.417	1378.6	10.282	0.400	210.0
3010-K5- 5	11493.0	1198.5	28.2	11.402	7.900	2.056	0.561	-2.614	-2.417	1294.5	8.874	0.400	210.0
3010-K5- 6	11490.8	1199.3	25.0	11.407	7.509	2.061	0.561	-2.614	-2.417	1294.9	8.881	0.400	210.0
3010-K6- 1	10735.4	1118.9	7.1	7.794	11.133	3.130	-2.781	-3.423	-4.393	1275.1	9.812	0.400	210.0
3010-K6- 2	9275.1	975.6	-48.6	7.400	11.300	2.930	-2.781	-3.423	-4.393	1199.9	8.585	0.500	225.0
3010-K6- 3	7861.5	838.2	-75.5	7.100	11.600	2.700	-2.781	-3.423	-4.393	1131.4	7.496	0.500	225.0
3010-K6- 4	11762.2	1183.8	75.5	8.000	10.900	3.400	-2.781	-3.423	-4.393	1313.1	10.559	0.400	210.0
3010-K6- 5	11490.8	1242.5	8.6	8.150	11.475	3.147	-2.781	-3.423	-4.393	1333.3	10.355	0.400	210.0
3010-K6- 6	11493.3	1196.2	33.7	8.225	11.170	3.229	-2.781	-3.423	-4.393	1314.9	10.371	0.400	210.0
3010-K6- 7	11506.0	1230.3	28.7	8.036	11.194	3.203	-2.781	-3.423	-4.393	1316.8	10.375	0.400	210.0
3010-K7- 1	10634.4	1094.5	13.8	4.136	4.775	-0.995	-7.690	3.548	1.191	1307.2	9.912	0.850	240.0
3010-K7- 2	11351.1	1187.8	28.2	4.400	4.500	-0.960	-7.690	3.548	1.191	1355.0	10.331	0.890	240.0
3010-K7- 3	13512.8	1271.0	75.9	4.800	4.400	-1.100	-7.690	3.548	1.191	1434.1	11.387	0.890	240.0
3010-K7- 4	10092.7	948.3	37.8	3.700	4.100	-0.930	-7.690	3.548	1.191	1243.0	9.589	0.890	225.0
3010-K7- 5	11478.8	1231.4	28.8	4.442	4.857	-0.965	-7.690	3.548	1.191	1363.0	10.408	0.890	240.0
3010-K8- 1	10479.9	1073.8	-2.5	4.163	7.588	0.746	-7.168	0.954	-1.329	1281.5	9.268	1.000	270.0
3010-K8- 2	11810.1	1142.7	88.5	4.400	7.600	0.990	-7.168	0.954	-1.329	1331.0	9.950	1.000	270.0
3010-K8- 3	13436.4	1225.4	196.3	4.900	7.300	1.200	-7.168	0.954	-1.329	1396.0	10.838	1.000	270.0
3010-K8- 4	8866.7	930.0	-74.3	3.700	8.100	0.400	-7.168	0.954	-1.329	1191.9	8.376	1.000	270.0
3010-K8- 5	11463.3	1170.7	57.0	4.456	7.932	0.963	-7.168	0.954	-1.329	1334.8	9.823	1.000	270.0
3010-K8- 6	11456.0	1164.5	52.3	4.438	7.908	0.932	-7.168	0.954	-1.329	1332.6	9.812	1.000	270.0
3010-K8- 7	11492.5	1193.7	32.7	4.518	8.090	0.860	-7.168	0.954	-1.329	1344.6	9.859	1.000	270.0
3010-K8- 8	11494.5	1199.2	25.0	4.535	8.129	0.848	-7.168	0.954	-1.329	1346.8	9.865	1.000	270.0

TABLE XV. LIST OF COMPUTER RUNS FOR THE CTR-A2 CONFIGURATION. V = 160 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS						
CASE NO	FZ	FX	FY	θOS	P1S	θ1S	DOS	C1S	D1C	HP	ALFA	ALFA MAX RAD	AZM
401-A1- 1	10993.4	2090.1	-700.6	19.022	10.085	-1.850	-2.440	5.116	-1.281	2479.4	13.526	1.000	270.0
401-A1- 2	11153.5	2150.5	-651.4	19.306	10.400	-1.500	-2.440	5.116	-1.281	2535.7	13.755	1.000	270.0
401-A1- 3	10540.3	2151.6	-704.3	19.600	10.600	-1.300	-2.440	5.116	-1.281	2521.4	13.431	1.000	270.0
401-A1- 4	11163.1	2034.6	-755.7	18.800	9.700	-2.100	-2.440	5.116	-1.281	2458.6	13.359	1.000	270.0
401-A1- 5	[illegible]	2208.3	-752.4	19.345	10.492	-1.943	-2.440	5.116	-1.281	2577.0	14.012	1.000	270.0
401-A2- 1	11653.8	2254.4	-747.1	18.990	12.990	-3.890	-0.593	-0.572	-0.432	2386.4	12.081	1.000	285.0
401-A2- 2	8930.4	1859.1	619.3	18.700	12.500	4.100	-0.593	-0.572	-0.432	2154.0	5.838	1.000	285.0
401-A2- 3	7146.9	1277.6	505.4	19.000	11.900	4.100	-0.593	-0.572	-0.432	1873.7	8.418	1.000	285.0
401-A2- 4	9169.9	1869.1	495.2	18.900	13.000	3.300	-0.593	-0.572	-0.432	2200.9	10.173	1.000	285.0
401-A2- 5	8435.4	1679.1	133.5	18.347	12.858	1.300	-0.593	-0.572	-0.432	2047.0	9.621	1.000	285.0
401-A2- 6	9530.7	1907.2	-166.1	18.331	12.843	-0.700	-0.593	-0.572	-0.432	2161.0	10.514	1.000	285.0
401-A2- 7	10791.3	2128.9	-416.0	19.356	12.885	-2.700	-0.593	-0.572	-0.432	2297.8	11.389	1.000	285.0
401-A2- 8	11317.1	2229.3	-670.8	18.440	13.038	-3.500	-0.593	-0.572	-0.432	2362.5	11.829	1.000	285.0
401-A2- 9	11301.0	2383.0	-573.7	18.973	13.824	-2.880	-0.593	-0.572	-0.432	2411.3	12.176	1.000	285.0
401-A2-10	11449.8	2208.0	-748.0	18.290	12.806	-3.922	-0.593	-0.572	-0.432	2358.3	11.913	1.000	285.0
401-A4- 1	10321.3	1702.7	-651.7	18.623	9.760	-10.030	-0.590	0.803	6.660	2511.6	5.521	1.000	345.0
401-A4- 2	8509.0	1352.4	-656.7	18.300	10.000	-5.700	-0.590	0.803	6.660	2263.0	8.280	1.000	345.0
401-A4- 3	9252.2	1548.0	-614.8	18.700	10.200	-5.400	-0.590	0.803	6.660	2396.2	8.739	1.000	345.0
401-A4- 4	11823.9	2032.2	-154.4	18.500	5.400	-10.000	-0.590	0.803	6.660	2709.1	10.645	1.000	345.0
401-A5- 1	10632.9	1895.5	-676.2	19.254	6.560	-7.995	-2.436	6.449	5.810	2653.0	11.044	1.000	240.0
401-A5- 2	12434.9	2331.4	-721.7	19.600	6.600	-8.300	-2.436	6.449	5.810	2925.8	12.046	1.000	240.0
401-A5- 3	12121.3	2072.2	-768.4	19.000	5.900	-8.400	-2.436	6.449	5.810	2801.4	11.724	1.000	225.0
401-A5- 4	7693.5	1065.3	-557.8	18.700	7.300	-7.400	-2.436	6.449	5.810	2181.3	9.037	1.000	225.0
401-A5- 5	11203.3	2022.8	-729.9	19.340	6.880	-8.296	-2.436	6.449	5.810	2739.6	11.473	1.000	240.0
401-A5- 6	11531.2	2196.9	-756.1	19.812	7.516	-8.319	-2.436	6.449	5.810	2849.7	11.759	1.000	240.0
401-A5- 7	11526.9	2214.3	-750.8	19.829	7.536	-8.270	-2.436	6.449	5.810	2848.2	11.793	1.000	240.0
401-A6- 1	10950.7	1985.0	-692.2	19.454	7.121	-3.994	-3.361	8.646	1.840	2661.4	13.050	1.000	255.0
401-A6- 2	12208.1	2285.6	-786.8	19.700	6.800	-4.200	-3.361	8.646	1.840	2860.8	13.932	1.000	255.0
401-A6- 3	8258.7	1261.8	-524.9	18.900	7.400	-3.600	-3.361	8.646	1.840	2235.6	11.328	1.000	240.0
401-A6- 4	8411.5	1342.4	-489.0	19.100	7.600	-3.300	-3.361	8.646	1.840	2279.1	11.496	1.000	240.0
401-A6- 5	11372.2	2108.5	-727.3	19.575	7.081	-4.002	-3.361	8.646	1.840	2740.5	13.384	1.000	255.0
401-A6- 6	11684.9	2156.0	-735.5	19.722	7.376	-4.015	-3.361	8.646	1.840	2766.6	13.461	1.000	255.0
401-A6- 7	11493.3	2182.2	-740.5	19.792	7.421	-4.022	-3.361	8.646	1.840	2783.1	13.518	1.000	255.0
401-A6- 8	11547.1	2211.7	-765.6	19.856	7.489	-4.034	-3.361	8.646	1.840	2801.4	13.588	1.000	255.0
401-A7- 1	11443.9	2130.3	-712.4	20.650	13.165	-4.025	2.066	-2.394	-0.099	2342.1	11.881	1.000	300.0
401-A7- 2	9801.7	1835.1	-650.6	20.350	13.400	-3.800	2.066	-2.394	-0.099	2159.5	10.784	1.000	300.0
401-A7- 3	11064.6	2154.0	-643.5	20.900	13.700	-3.600	2.066	-2.394	-0.099	2342.9	11.842	1.000	300.0
401-A7- 4	9732.6	1716.0	-714.7	19.900	12.900	-4.300	2.066	-2.394	-0.099	2101.9	10.585	1.000	300.0
401-A7- 5	10790.5	1905.9	-823.8	20.074	12.687	-4.792	2.066	-2.394	-0.099	2218.3	11.365	1.000	300.0
401-A7- 6	11404.5	2167.7	-750.7	20.819	13.520	-4.174	2.066	-2.394	-0.099	2380.8	12.105	1.000	300.0
401-A7- 7	11501.4	2211.5	-745.8	20.542	13.676	-4.111	2.066	-2.394	-0.099	2385.5	12.234	1.000	300.0
401-A8- 1	11624.8	2204.3	-737.4	19.899	13.074	-3.989	1.179	-1.786	-0.210	2355.6	11.929	1.000	300.0
401-A8- 2	12643.6	2356.0	-783.4	20.100	12.800	-4.200	1.179	-1.786	-0.210	2472.2	13.043	1.000	285.0
401-A8- 3	9872.4	1897.3	-637.3	19.600	13.300	-3.600	1.179	-1.786	-0.210	2163.2	10.632	1.000	300.0
401-A8- 4	7051.6	1335.1	-445.6	19.300	13.600	-2.700	1.179	-1.786	-0.210	1897.6	5.159	1.000	300.0
401-A8- 5	11500.4	2174.3	-752.7	19.852	13.083	-4.069	1.179	-1.786	-0.210	2337.4	11.828	1.000	300.0
401-A8- 6	11433.0	2177.6	-740.1	19.876	13.141	-4.033	1.179	-1.786	-0.210	2337.6	11.791	1.000	300.0
401-A8- 7	11609.8	2257.5	-752.5	20.103	13.454	-4.004	1.179	-1.786	-0.210	2382.1	12.033	1.000	300.0
401-A8- 8	11504.3	2210.5	-745.7	19.970	13.275	-4.005	1.179	-1.786	-0.210	2355.7	11.890	1.000	300.0
401-A9- 1	11364.0	2172.5	-731.0	18.319	13.386	-3.546	-0.440	-1.159	-0.952	2345.8	12.313	1.000	285.0
401-A9- 2	13061.3	2376.1	-788.4	19.600	13.305	-3.800	-0.440	-1.159	-0.952	2503.9	13.949	1.000	285.0
401-A9- 3	12710.1	2451.1	-698.5	18.900	13.600	-3.300	-0.440	-1.159	-0.952	2526.1	13.753	1.000	285.0
401-A9- 4	11329.6	2079.8	-763.5	18.900	12.900	-3.600	-0.440	-1.159	-0.952	2298.7	12.128	1.000	285.0
401-A9- 5	11537.1	2222.5	-741.1	18.447	13.543	-3.562	-0.440	-1.159	-0.952	2375.3	12.466	1.000	285.0

				PITCH ECPP CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	AOS	B1S	A1S	OOS	C1S	C1C	HP	ALFA	RAD	AZP
401-4A- 1	11724.9	2258.3	-752.2	19.1-5	12.582	-3.936	0.293	-1.179	-0.321	2378.6	11.940	1.CCC	285.0
401-4A- 2	12256.5	2390.6	-377.5	19.400	12.6CC	-2.100	0.293	-1.179	-0.321	2443.1	12.356	1.CC0	285.0
401-4A- 3	11943.8	2181.0	-788.3	18.800	12.300	-4.200	C.293	-1.179	-0.321	2345.4	11.930	1.C00	285.0
401-4A- 4	11181.6	2318.2	-251.6	19.800	13.300	-1.300	0.293	-1.179	-0.321	2318.5	11.540	1.000	285.0
401-4A- 5	11501.3	2213.1	-737.6	19.C71	12.543	-3.888	0.293	-1.179	-0.321	2350.2	11.737	1.CC0	285.0
401-4A- 6	11504.0	2211.1	-745.2	19.067	12.538	-3.930	0.293	-1.179	-0.321	2349.4	11.737	1.C00	285.0
401-4C- 1	11047.7	2092.8	-715.5	18.247	13.891	-3.206	-0.285	-1.751	-1.473	2305.1	12.516	1.C00	285.0
401-4C- 2	12399.5	2250.1	-784.1	18.530	13.600	-3.500	-0.285	-1.751	-1.473	2432.1	13.272	1.CC0	285.0
401-4C- 3	12177.5	2332.7	-676.5	18.800	14.100	-2.900	-0.285	-1.751	-1.473	2458.2	13.758	1.000	285.0
401-4C- 4	13599.6	2329.5	-815.6	18.700	13.720	-3.800	-0.285	-1.751	-1.473	2530.3	15.212	1.CC0	285.0
401-4C- 5	11509.4	2166.5	-737.6	18.352	13.835	-3.213	-0.285	-1.751	-1.473	2355.8	12.924	1.CC0	285.0
401-4C- 6	11347.6	2148.7	-736.0	18.349	13.911	-3.266	-0.285	-1.751	-1.473	2342.1	12.798	1.CC0	285.0
401-4C- 7	11472.2	2193.8	-743.8	18.464	14.C55	-3.280	-0.285	-1.751	-1.473	2369.3	12.962	1.000	285.0
401-2B- 1	11614.2	2171.3	-723.7	22.144	11.152	-6.039	2.01°	0.215	2.763	2635.6	9.534	1.CC0	330.0
401-2B- 2	13208.0	2494.0	-735.3	22.400	10.800	-6.300	2.013	C.215	2.763	2824.2	10.651	1.000	315.C
401-2B- 3	9681.6	1719.6	-650.4	21.800	11.400	-5.700	2.013	0.215	2.763	2369.8	8.279	1.000	330.0
401-2B- 4	7621.7	1215.5	-603.8	21.500	11.700	-5.500	2.013	0.215	2.763	2067.6	6.451	1.CC0	315.0
401-2B- 5	11352.9	2127.4	-724.0	22.129	11.258	-5.599	2.013	0.215	2.763	2609.4	9.364	1.CC0	330.0
401-2B- 6	11360.6	2060.3	-715.2	21.878	10.812	-6.016	2.013	0.215	2.763	2577.8	9.279	1.000	330.C
401-2B- 7	11477.5	2243.3	-738.8	22.488	11.832	-6.031	2.013	0.215	2.763	2685.6	9.577	1.000	330.0
401-2B- 8	11526.3	2215.3	-766.4	22.372	11.83C	-6.197	2.013	0.215	2.763	2656.1	9.578	1.000	330.C
401-2B- 9	11480.9	2204.2	-745.8	22.358	11.901	-6.099	2.013	0.215	2.763	2648.9	9.538	1.000	330.0
401-2C- 1	11471.3	2132.5	-715.7	21.603	13.424	-4.202	2.874	-2.818	0.119	2402.9	12.C47	1.CC0	300.0
401-2C- 2	9720.3	1835.7	-667.5	21.300	13.700	-4.050	2.874	-2.818	0.119	2201.6	10.719	1.000	300.0
401-2C- 3	10458.6	1670.1	-743.2	21.100	13.100	-4.500	2.874	-2.818	0.119	2248.9	11.180	1.000	300.0
401-2C- 4	10125.7	1752.7	-777.2	20.800	12.800	-4.800	2.874	-2.818	0.119	2181.1	10.843	1.000	300.0
401-2C- 5	11851.C	2257.1	-1014.2	21.579	14.186	-5.585	2.874	-2.818	0.119	2481.7	12.773	1.000	30C.C
401-2C- 6	11535.6	2276.8	-728.8	21.539	13.995	-4.180	2.874	-2.818	0.119	2451.9	12.265	1.000	300.0
401-2C- 7	11512.2	2212.5	-765.9	21.885	13.922	-4.280	2.874	-2.818	0.119	2444.6	12.251	1.000	300.0
401-2D- 1	7043.2	1114.2	-495.2	13.165	14.441	-1.661	-4.984	-0.062	-3.831	1866.5	11.841	1.CC0	285.0
401-2D- 2	8544.2	1383.0	-605.0	13.400	14.100	-1.900	-4.984	-0.062	-3.831	2021.5	12.944	1.000	285.0
401-2D- 3	5227.6	726.5	-345.7	12.800	14.700	-1.300	-4.984	-0.062	-3.831	1653.0	10.731	1.000	285.0
401-2D- 4	9738.9	1590.0	-683.8	13.600	13.800	-2.100	-4.984	-0.062	-3.831	2140.6	13.900	1.C00	270.C
401-2D- 5	12499.4	2289.8	-904.1	16.205	16.508	-2.728	-4.984	-0.062	-3.831	2703.3	17.724	1.000	270.0
401-2D- 6	13442.8	2504.9	-905.6	18.205	18.508	-2.702	-4.984	-0.062	-3.831	2979.7	15.482	1.000	270.0
401-2D- 7	12828.2	2761.1	-843.7	18.551	19.673	-2.253	-4.984	-0.062	-3.831	3053.3	19.011	1.CC0	270.0
401-2D- 8	12391.6	2464.2	-792.1	16.851	17.512	-2.108	-4.984	-0.062	-3.831	2798.4	17.966	1.000	270.0
401-2D- 9	10503.7	1916.7	-71C.8	14.779	15.301	-1.941	-4.984	-0.062	-3.831	2309.0	15.074	1.000	270.C
401-2D-10	11713.7	2312.8	-752.3	15.581	16.587	-1.994	-4.984	-0.062	-3.831	2647.0	16.701	1.000	270.0
401-2D-11	11607.5	2319.3	-75C.8	16.C05	16.646	-1.983	-4.984	0.062	-3.831	2650.0	16.650	1.CC0	270.C
401-2D-12	11428.6	2156.3	-745.4	15.454	15.889	-2.019	-4.984	-0.062	-3.831	2541.3	16.186	1.CC0	270.0
401-2D-13	11548.5	2212.2	-757.3	15.636	16.147	-2.001	-4.984	-0.062	-3.831	2577.5	16.341	1.000	270.0
401-2E- 1	7462.2	1255.3	-465.4	20.421	17.569	-0.529	4.598	-8.884	-5.169	1691.8	12.537	1.CC0	300.0
401-2E- 2	6133.4	990.5	-376.6	20.200	18.100	-C.350	4.598	-8.884	-5.169	1741.5	11.212	1.CCC	300.0
401-2E- 3	8968.6	1695.9	-563.5	20.800	17.600	-C.750	4.598	-8.884	-5.169	2051.3	14.206	1.CCC	300.0
401-2E- 4	7036.9	1080.3	-500.2	19.600	17.300	-1.100	4.598	-8.884	-5.169	1836.5	11.332	1.CC0	300.0
401-2E- 5	10445.0	1812.3	-6C1.8	21.701	17.581	-C.916	4.598	-8.884	-5.169	2301.6	17.410	1.CC0	300.0
401-2E- 6	8421.2	1244.7	-346.1	19.786	15.561	C.256	4.598	-8.884	-5.169	1890.8	12.563	1.000	300.0
401-2E- 7	11451.7	1807.4	-8C7.9	21.746	17.561	-2.096	4.598	-8.884	-5.169	2352.2	18.372	1.CC0	300.C
401-2E- 8	11153.1	2166.0	-767.2	23.205	20.424	-1.547	4.598	-8.884	-5.169	2532.C	18.704	1.CCC	300.0
401-2E- 9	11400.8	2185.0	-733.3	23.286	20.337	-1.411	4.598	-8.884	-5.169	2556.5	19.174	1.000	300.0
401-2E-10	11501.5	2212.6	-764.5	23.396	20.440	-1.440	4.598	-8.884	-5.169	2579.2	19.403	1.C00	300.C
401-2F- 1	8685.0	1412.5	-609.9	10.299	5.770	-4.952	-11.067	8.898	0.804	2213.2	14.318	1.000	240.0
401-2F- 2	7037.2	1132.3	-474.5	9.900	5.400	-4.600	-11.067	8.898	0.804	2035.4	14.274	1.CC0	240.0
401-2F- 3	7953.5	1379.0	-491.9	10.475	5.800	-4.300	-11.067	8.898	0.804	2103.9	14.493	1.000	240.0
401-2F- 4	9675.8	1578.8	-882.1	10.800	6.500	-5.200	-11.067	8.898	0.804	2397.1	14.864	1.CC0	225.0
401-2F- 5	11393.0	2057.6	-623.3	11.534	5.831	-6.549	-11.067	8.898	0.804	2669.4	15.366	1.000	225.0
401-2F- 6	11311.5	2079.1	-812.C	12.C90	10.CC5	-5.459	-11.067	8.598	0.804	2695.3	15.770	1.000	225.0
401-2F- 7	11468.8	2209.3	-778.9	12.486	10.506	-5.028	-11.067	8.898	0.804	2778.9	15.419	0.970	225.0
401-2G- 1	7168.7	1055.1	-502.4	9.757	11.547	-3.115	-10.205	5.865	-1.840	2033.7	14.404	1.000	255.0
401-2G- 2	6869.8	940.4	-513.5	9.400	11.200	-3.400	-10.205	5.865	-1.840	1965.0	14.157	1.000	255.0
401-2G- 3	9049.1	1357.3	-663.8	10.100	11.000	-3.600	-10.205	5.865	-1.840	2232.5	15.147	1.CC0	255.0
401-2G- 4	5267.6	710.2	-514.0	9.250	11.800	-3.900	-10.205	5.865	-1.840	1867.6	13.363	1.CC0	255.0
401-2G- 5	6296.3	1150.7	-491.3	11.25C	14.881	-2.872	-10.205	5.865	-1.840	2135.5	14.373	1.000	255.0
401-2G- 6	10719.3	2181.2	-564.8	12.946	14.C27	-2.570	-10.205	5.865	-1.840	2743.6	16.145	1.CC0	255.0
401-2G- 7	11066.9	2152.4	-718.8	12.835	11.822	-3.240	-10.205	5.865	-1.840	2741.2	16.140	1.000	255.0
401-2G- 8	11360.5	2151.9	-742.6	12.933	13.430	-3.309	-10.205	5.865	-1.840	2753.3	16.181	1.000	270.0
401-2G- 9	11472.9	2200.9	-742.7	13.032	13.641	-3.282	-10.205	5.865	-1.840	2789.8	16.309	1.C00	270.C
401-2H- 1	5393.4	522.1	-385.4	9.216	13.814	-1.278	-9.344	2.832	-4.485	1834.9	13.170	1.CC0	270.0
401-2H- 2	6940.5	826.3	-501.5	9.500	13.400	-1.500	-9.344	2.832	-4.485	2007.7	14.344	1.CC0	270.0
401-2H- 3	3657.2	159.6	-237.7	8.900	14.1CC	-C.950	-9.344	2.832	-4.485	1640.2	11.969	1.CC0	270.0
401-2H- 4	8347.2	1064.1	-612.6	9.890	13.100	-1.800	-9.344	2.832	-4.485	2152.6	15.340	1.CC0	270.0
401-2H- 5	10843.0	1159.7	-467.5	9.693	10.547	-C.610	-9.344	2.832	-4.485	2223.8	16.715	1.000	270.0
401-2H- 6	10829.9	1160.5	-467.1	9.690	10.956	-C.678	-9.344	2.832	-4.485	2224.0	16.717	1.CC0	270.C
401-2H- 7	8965.3	1159.4	-565.4	9.911	12.792	-1.367	-9.344	2.832	-4.485	2202.8	15.744	1.CC0	270.0
401-2H- 8	10390.7	1713.C	-477.5	11.911	14.752	-0.192	-9.344	2.832	-4.485	2562.9	17.278	1.CC0	270.0
401-2H- 9	11657.8	2171.2	-724.5	13.5.1	16.792	-1.523	-9.344	2.832	-4.485	2888.C	18.519	1.000	270.0
401-2H-10	11515.0	2182.C	-756.3	13.514	16.985	-1.656	-9.344	2.832	-4.485	2899.1	18.425	1.C00	270.0
401-2H-11	11489.0	2212.0	-744.9	14.034	17.168	-1.592	-9.344	2.832	-4.485	2906.3	18.446	1.CC0	270.0

TABLE XV - Continued

CASE NO	FF	FR	FV	PITCH HORN CONTROLS A0S	A1S	B1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
5000-41- 1	4393.1	27.9	-362.9	21.190	11.100	-4.230	1.900	1.500	1.700	1501.5	4.130	1.000	300.0
5000-41- 2	8769.7	1920.6	-625.5	21.190	11.100	-4.230	1.300	1.300	1.300	2210.0	7.512	1.000	295.0
5000-41- 3	5602.9	488.3	-457.0	21.190	11.100	-4.230	1.600	1.700	1.300	1719.1	5.025	1.000	285.0
5000-41- 4	11772.2	2265.3	-732.9	21.190	11.100	-4.230	1.000	1.000	1.000	2578.3	10.161	1.000	295.0
5000-41- 5	11361.9	2239.6	-805.1	21.190	11.100	-4.230	0.707	1.659	0.772	2556.6	10.098	1.000	285.0
5000-41- 6	11510.5	2218.7	-748.5	21.190	11.100	-4.230	0.961	1.187	0.958	2555.4	9.980	1.000	285.0
5000-42- 1	9411.9	1393.6	-347.6	20.900	11.600	-2.530	-0.595	2.358	1.043	2321.9	9.363	1.000	270.0
5000-42- 2	12637.9	2652.3	-555.8	20.500	11.100	-3.100	-0.595	2.358	1.090	2754.0	11.690	1.000	270.0
5000-42- 3	15339.1	3119.9	-512.3	21.100	10.500	-3.630	-0.595	2.358	1.090	3117.1	14.362	1.000	270.0
5000-42- 4	17425.7	2999.9	-446.6	21.630	10.900	-4.090	-0.595	2.358	1.090	3195.7	15.857	1.000	270.0
5000-42- 5	16756.8	3065.7	-785.4	21.273	10.377	-4.746	-0.595	2.358	1.090	3173.3	15.383	1.000	270.0
5000-42- 6	11956.2	2470.6	-709.5	20.301	11.299	-4.039	-0.595	2.359	1.090	2652.5	11.220	1.000	270.0
5000-42- 7	11634.3	2432.0	-773.0	20.228	11.372	-4.356	-0.595	2.358	1.080	2615.1	10.955	1.000	270.0
5000-42- 8	11718.3	2478.8	-356.7	20.402	11.198	-2.356	-0.595	2.358	1.040	2646.8	10.990	1.000	270.0
5000-42- 9	16650.2	2946.2	883.0	22.402	9.198	-0.356	-0.595	2.358	1.040	3107.3	17.167	1.000	270.0
5000-42-10	11012.7	2319.0	-366.6	20.282	11.318	-2.356	-0.595	2.358	1.040	2554.9	10.541	1.000	270.0
5000-42-11	12553.7	2214.5	-256.4	20.269	11.331	-1.793	-0.595	2.358	1.040	2494.9	10.127	1.000	270.0
5000-42-12	12759.1	2647.7	-669.4	20.460	11.140	-3.031	-0.595	2.358	1.080	2758.9	11.763	1.000	270.0
5000-42-13	12637.0	2561.1	-1112.2	20.267	11.319	-5.331	-0.595	2.358	1.080	2716.7	11.695	1.000	270.0
5000-42-14	11675.2	2434.8	-467.5	20.324	11.161	-2.912	-0.595	2.358	1.080	2674.1	10.929	1.000	270.0
5000-42-15	[illegible]	2669.8	-1097.4	19.787	10.094	-5.432	-0.595	2.358	1.090	2700.1	11.769	1.000	270.0
5000-42-16	11755.8	2293.8	-762.6	19.826	10.619	-4.401	-0.595	2.359	1.080	2563.3	10.799	1.000	270.0
5000-42-17	11562.9	2219.6	-751.2	19.687	10.473	-4.391	-0.595	2.358	1.080	2521.9	10.587	1.000	270.0
5000-43- 1	16835.0	2516.1	-716.1	20.900	11.600	-2.530	-0.040	0.180	-1.453	2672.4	16.373	1.000	295.0
5000-43- 2	15571.8	1968.8	-722.4	20.500	11.100	-3.100	-0.040	0.180	-1.453	2675.8	18.898	1.000	245.0
5000-43- 3	[illegible]	1687.4	-490.6	21.100	10.500	-3.630	-0.040	0.180	-1.453	2629.9	21.272	1.000	245.0
5000-43- 4	15579.0	1196.1	-308.1	21.630	10.996	-4.090	-0.040	0.180	-1.453	2656.9	26.318	0.400	225.0
5000-43- 5	12328.3	2163.2	-490.5	19.600	12.000	-1.098	-0.040	0.180	-1.453	2441.9	13.399	1.000	295.0
5000-43- 6	7627.1	1346.2	-185.7	18.865	12.755	0.172	-0.040	0.180	-1.453	1977.2	9.599	1.000	295.0
5000-43- 7	9656.8	1640.6	-607.6	19.002	12.598	-2.135	-0.040	0.180	-1.453	2131.5	11.359	1.000	285.0
5000-43- 8	11033.1	2031.7	-356.3	19.195	12.405	-2.455	-0.040	0.180	-1.453	2286.0	12.378	1.000	285.0
5000-43- 9	11411.6	2155.7	-735.1	19.287	12.313	-2.539	-0.040	0.180	-1.453	2329.1	12.646	1.000	235.0
5000-43-10	11249.6	2136.7	-750.5	19.255	12.345	-2.532	-0.040	0.180	-1.453	2316.6	12.569	1.000	295.0
5000-43-11	11526.7	2156.6	-675.3	19.337	12.253	-2.476	-0.040	0.180	-1.453	2344.8	12.726	1.000	235.0
5000-43-12	11524.1	2164.9	-716.3	19.362	12.372	-2.392	-0.040	0.180	-1.453	2345.1	12.752	1.000	245.0
5000-43-13	11539.2	2190.2	-743.2	19.426	12.552	-2.516	-0.040	0.180	-1.453	2350.2	12.750	1.000	285.0
5000-44- 1	13195.6	2230.4	-362.6	19.900	12.000	-2.000	0.427	-1.826	-0.860	2435.3	13.596	1.000	295.0
5000-44- 2	14712.5	2395.4	-354.0	19.300	11.700	-2.330	0.427	-1.826	-0.860	2550.9	15.469	1.000	245.0
5000-44- 3	14244.1	2535.7	130.4	19.690	12.990	0.300	0.427	-1.826	-0.860	2591.6	14.876	1.000	255.0
5000-44- 4	10740.9	2015.8	-353.8	18.700	12.700	-1.730	0.427	-1.826	-0.860	2235.7	11.635	1.000	295.0
5000-44- 5	11346.3	1961.2	-556.9	18.269	12.006	-3.120	0.427	-1.826	-0.460	2229.3	11.712	1.000	245.0
5000-44- 6	10676.6	1778.4	-624.8	17.724	11.348	-3.453	0.427	-1.826	-0.860	2129.4	11.147	1.000	285.0
5000-44- 7	11321.4	2155.3	-700.0	18.991	11.486	-3.449	0.427	-1.826	-0.860	2337.3	12.113	1.000	245.0
5000-44- 8	11654.0	2208.4	-947.9	19.124	11.679	-3.652	0.427	-1.826	-0.840	2363.4	12.327	1.000	285.0
5000-45- 1	9456.7	1815.1	-393.6	19.000	12.300	-2.030	-0.037	0.244	-0.195	2135.9	9.959	1.000	235.0
5000-45- 2	11620.1	2226.6	-470.8	19.300	11.700	-2.330	-0.037	0.244	-0.195	2369.3	11.236	1.000	235.0
5000-45- 3	13624.2	2191.2	-37.1	19.600	12.000	0.300	-0.037	0.244	-0.195	2336.0	10.765	1.000	235.0
5000-45- 4	6792.5	1168.8	-360.5	18.700	12.900	-1.700	-0.037	0.244	-0.195	1779.5	8.168	1.000	235.0
5000-45- 5	11563.1	2165.0	-753.2	18.958	11.390	-3.759	-0.037	0.244	-0.195	2333.1	11.327	1.000	235.0
5000-45- 6	11671.2	2187.8	-788.8	19.166	11.450	-3.493	-0.037	0.244	-0.195	2351.7	11.361	1.000	235.0
5000-45- 7	11534.8	2239.6	-768.0	19.274	11.982	-3.467	-0.037	0.244	-0.195	2363.1	11.391	1.000	235.0

TABLE XV - Continued

CASE NO	FZ	FX	FY	PITCH WORK CONTROLS A1S	B1S	A1S	FLAP CONTROLS A0S	B1S	C1C	HP	ALFA	TAD	AZM
5000-46- 1	11213.4	2178.0	-618.5	18.700	12.930	-2.330	-1.472	0.596	-1.476	2322.5	12.896	1.000	245.0
5000-46- 2	9757.7	1897.6	-638.4	18.633	12.893	-2.330	-0.472	0.596	-1.476	2149.9	11.822	1.000	245.0
5000-46- 3	8369.9	1574.3	-618.4	18.100	13.100	-2.600	-0.472	0.596	-1.476	1966.1	10.896	1.000	245.0
5000-46- 4	14078.0	2659.2	-801.2	19.300	11.700	-2.930	-0.472	0.596	-1.476	2971.4	15.599	1.000	245.0
5000-46- 5	11572.7	2208.1	-706.0	18.673	12.367	-2.671	-0.472	0.596	-1.476	2366.8	13.113	1.000	245.0
5000-46- 6	11442.6	2185.6	-739.6	18.615	12.369	-2.637	-0.472	0.596	-1.476	2333.6	13.064	1.000	245.0
5000-46- 7	11432.2	2176.3	-731.7	18.614	12.393	-2.571	-0.472	0.596	-1.476	2327.9	12.990	1.000	245.0
5000-46- 8	11343.9	2163.7	-725.8	18.598	12.407	-2.570	-0.872	0.596	-1.476	2313.0	12.917	1.000	245.0
5000-46- 9	11317.3	2158.1	-731.8	18.592	12.411	-2.586	-0.872	0.596	-1.476	2315.9	12.872	1.000	265.0
5000-46-10	11310.4	2160.7	-734.3	18.599	12.416	-2.596	-0.872	0.595	-1.476	2317.9	12.908	1.000	245.0
5000-46-11	11442.6	2199.5	-739.3	18.654	12.461	-2.632	-0.872	0.596	-1.476	2335.1	13.026	1.000	245.0
5000-47- 1	12714.1	2373.1	-522.3	18.700	12.500	-2.000	-0.637	-0.490	-1.322	2656.6	13.810	1.000	245.0
5000-47- 2	11357.6	2169.2	-595.1	18.400	12.800	-2.330	-0.637	-0.490	-1.322	2317.3	12.591	1.000	285.0
5000-47- 3	9456.9	1843.7	-612.7	18.100	13.1[illegible]	-2.600	-0.637	-0.490	-1.322	1966.1	11.347	1.000	245.0
5000-47- 4	15131.9	2395.2	-612.6	19.000	11.7[illegible]	-2.930	-0.637	-0.490	-1.322	2619.4	16.924	1.000	245.0
5000-47- 5	11324.3	2133.6	-665.9	18.298	12.761	-2.741	-0.637	-0.490	-1.322	2303.1	12.529	1.000	245.0
5000-47- 6	11343.0	2125.4	-700.3	18.265	12.739	-2.906	-0.637	-0.490	-1.322	2303.7	12.531	1.000	245.0
5000-47- 7	11521.4	2151.6	-726.5	18.288	12.696	-2.722	-0.637	-0.490	-1.322	2318.3	12.692	1.000	245.0
5000-47- 8	10713.2	2062.3	-610.8	19.229	12.967	-2.472	-0.697	-0.490	-1.322	2241.3	12.024	1.000	245.0
5000-47- 9	11547.5	2188.4	-761.4	18.413	12.597	-3.167	-0.637	-0.490	-1.322	2344.2	12.803	1.000	295.0
5000-47-10	11491.8	2204.1	-743.5	18.505	13.167	-3.362	-0.637	-0.490	-1.322	2345.7	12.745	1.000	285.0
5000-48- 1	10667.9	1934.5	-737.8	15.960	11.239	-4.172	-3.370	2.219	-0.019	2244.9	12.277	1.000	270.0
5000-48- 2	10313.0	1796.2	-745.9	15.600	10.900	-4.590	-3.370	2.219	-0.039	2165.4	11.472	1.000	270.0
5000-48- 3	7619.5	1339.4	-551.3	15.300	11.590	-3.900	-3.370	2.219	-0.039	1865.7	10.198	1.000	270.0
5000-48- 4	12914.5	2147.1	-657.9	16.200	10.600	-4.890	-3.370	2.219	-0.039	2446.5	13.982	1.000	270.0
5000-48- 5	11437.0	2108.1	-712.3	16.259	11.336	-4.089	-3.370	2.219	-0.039	2351.9	12.950	1.000	270.0
5000-48- 6	11034.7	1933.9	-799.3	15.733	10.851	-4.652	-3.370	2.219	-0.039	2255.6	12.492	1.000	270.0
5000-48- 7	11359.9	2107.0	-735.7	16.300	11.481	-4.198	-3.370	2.219	-0.019	2352.6	12.918	1.000	270.0
5000-48- 8	11502.6	2214.6	-744.1	16.632	11.981	-4.164	-3.370	2.219	-0.039	2415.4	13.175	1.000	270.0
5000-4F- 1	11356.1	2099.2	-721.8	16.096	9.960	-4.441	-3.463	3.932	0.699	2315.3	12.556	1.000	270.0
5000-4F- 2	12765.1	2246.8	-794.6	16.600	9.600	-4.700	-3.463	3.932	0.699	2494.4	13.775	1.000	270.0
5000-4F- 3	11173.1	1911.9	-796.3	15.700	9.300	-4.900	-3.463	3.932	0.679	2266.7	12.452	1.000	270.0
5000-4F- 4	14915.1	2371.2	-623.1	16.700	8.400	-4.100	-3.463	3.932	0.699	2652.6	14.856	1.000	255.0
5000-4F- 5	11425.3	2176.5	-726.0	16.557	10.521	-4.350	-3.463	3.932	0.697	2414.4	13.013	1.000	270.0
5000-4F- 6	11502.7	2208.3	-746.7	16.642	10.669	-4.430	-3.461	3.932	0.699	2433.5	13.105	1.000	270.0
5000-4G- 1	11464.2	2178.8	-755.2	17.640	11.624	-4.355	-1.691	1.122	0.316	2349.6	13.744	1.000	270.0
5000-4G- 2	10612.2	1933.5	-880.9	17.300	11.330	-4.900	-1.591	1.122	0.316	2232.3	11.060	1.000	270.0
5000-4G- 3	12551.7	2461.0	-623.7	17.900	11.030	-4.500	-1.691	1.122	0.316	2554.2	13.522	1.000	270.0
5000-4G- 4	15555.[illegible]	2566.3	-932.6	13.300	10.700	-4.930	-1.641	1.122	0.316	2715.5	15.226	1.000	270.0
5000-4G- 5	11341.[illegible]	2135.3	-726.7	17.512	11.412	-4.279	-1.691	1.122	0.316	2324.3	11.626	1.000	270.0
5000-4G- 6	6625.2	847.3	-227.6	15.512	9.412	-2.279	-1.651	1.122	0.316	1637.4	7.566	1.000	245.0
5000-4G- 7	11417.5	2187.1	-753.8	17.476	11.702	-4.379	-1.691	1.122	0.316	2353.2	11.751	1.000	270.0
5000-4G- 8	11452.9	2199.6	-766.9	17.709	11.795	-4.326	-1.691	1.122	0.316	2359.9	11.781	1.000	270.0
5000-4H- 1	11154.4	2032.7	-659.9	16.969	10.199	-3.716	-3.361	6.052	-0.579	2332.6	13.213	1.000	270.0
5000-4H- 2	9364.1	1817.3	-655.6	16.500	10.600	-3.[illegible]	-3.361	6.052	-0.570	2077.9	11.676	1.000	270.0
5000-4H- 3	9211.[illegible]	1611.5	-741.5	14.[illegible]	11.[illegible]	-3.[illegible]	-3.361	6.052	-0.570	2077.3	11.732	1.000	270.0
5000-4H- 4	[illegible]	1661.4	-[illegible]	14.[illegible]	10.[illegible]	-3.[illegible]	-3.361	6.056	-0.579	1873.4	11.156	1.000	270.0
5000-4H- 5	11675.2	2210.0	-733.6	17.462	10.[illegible]	-3.215	-3.361	6.[illegible]	-0.579	2466.4	13.652	1.000	270.0
5000-4H- 6	11513.2	2256.2	-757.9	17.619	10.987	-3.165	-3.361	6.059	-0.579	2467.1	13.643	1.000	270.0
5000-4M- 1	11217.6	2076.5	-721.3	16.441	10.906	-3.526	-2.935	2.793	-0.365	2306.1	12.889	1.000	270.0
5000-4M- 2	10130.4	1875.3	-629.9	16.500	10.600	-3.200	-2.935	2.793	-0.365	2195.1	12.163	1.000	270.0
5000-4M- 3	10638.1	1857.2	-760.3	16.300	10.300	-3.830	-2.935	2.793	-0.365	2178.9	12.233	1.000	270.0
5000-4M- 4	11210.9	2166.2	-626.7	17.100	11.200	-3.000	-2.935	2.793	-0.365	2341.2	12.982	1.000	270.0
5000-4M- 5	11749.7	2290.0	-727.6	17.442	11.631	-3.616	-2.935	2.793	-0.365	2437.6	13.565	1.000	270.0
5000-4M- 6	11474.6	2281.7	-752.9	17.210	11.499	-3.593	-2.935	2.793	-0.365	2370.5	13.263	1.000	270.0

TABLE XV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS			SERVO FLAP CONTROLS			HP	ALFA MAX		
				A0S	B1S	A1S	D0S	D1S	D1C		ALFA	RAD	AZM
5000-AT- 1	11315.5	2168.6	-719.5	17.700	11.097	-3.638	-2.090	2.245	-0.197	2359.2	12.491	1.000	270.0
5000-AT- 2	9721.6	1833.0	-626.7	17.400	11.397	-3.309	-2.090	2.245	-0.187	2150.6	11.105	1.000	270.0
5000-AT- 3	8617.9	1575.0	-626.5	17.100	11.600	-3.900	-2.090	2.245	-0.197	1997.4	10.429	1.000	270.0
5000-AT- 4	13532.7	2625.8	-851.7	18.000	10.700	-4.100	-2.090	2.245	-0.197	2566.0	14.119	1.000	270.0
5000-AT- 5	11690.4	2165.8	-735.8	17.709	11.123	-3.621	-2.090	2.245	-0.197	2357.3	12.471	1.000	270.0
5000-AT- 6	11676.4	2161.4	-734.0	17.692	11.096	-3.619	-2.090	2.245	-0.197	2354.5	12.458	1.000	270.0
5000-AT- 7	11621.9	2240.5	-751.6	17.914	11.440	-3.692	-2.090	2.245	-0.197	2399.3	12.660	1.000	270.0
5000-AT- 8	11542.6	2220.8	-748.9	17.876	11.337	-3.643	-2.090	2.245	-0.197	2387.1	12.593	1.000	270.0
5000-AW- 1	11293.6	2075.0	-725.9	16.975	9.775	-4.297	-3.233	4.017	0.774	2389.7	12.217	1.000	270.0
5000-AW- 2	10962.8	1943.8	-766.2	16.675	9.475	-4.597	-3.233	4.017	0.774	2309.8	11.883	1.000	255.0
5000-AW- 3	10692.8	1829.5	-805.5	16.375	9.175	-4.097	-3.233	4.017	0.774	2243.9	11.580	1.000	255.0
5000-AW- 4	12051.0	2218.9	-939.7	17.200	10.000	-5.200	-3.233	4.017	0.774	2485.0	12.864	1.000	270.0
5000-AW- 5	12458.9	2476.3	-697.9	17.881	10.681	-3.969	-3.233	4.017	0.774	2632.4	13.393	1.003	270.0
5000-AW- 6	8170.3	1270.3	-224.5	15.881	8.681	-1.969	-3.233	4.017	0.774	1943.1	9.799	1.000	255.0
5000-AW- 7	7549.5	942.4	-465.1	14.749	7.547	-3.969	-3.233	4.017	0.774	1762.4	8.995	1.000	255.0
5000-AW- 8	10844.0	1934.1	-712.6	16.695	9.501	-4.335	-3.233	4.017	0.774	2301.7	11.803	1.003	255.0
5000-AW- 9	11969.0	2387.4	-687.3	17.761	10.732	-3.926	-3.233	4.017	0.774	2570.1	13.016	1.000	270.0
5000-AW-10	11481.4	2103.9	-757.1	17.365	10.357	-4.360	-3.233	4.017	0.774	2456.2	12.518	1.000	270.0
5000-AW-11	11485.0	2206.5	-746.3	17.374	10.353	-4.305	-3.233	4.017	0.774	2457.2	12.521	1.000	270.0
5000-AX- 1	11318.6	1988.8	-711.4	16.136	9.583	-4.146	-4.077	4.566	0.596	2331.1	12.804	1.000	255.0
5000-AX- 2	12620.1	2208.7	-774.7	16.400	9.200	-4.400	-4.077	4.566	0.596	2501.1	13.922	1.000	255.0
5000-AX- 3	13788.9	2467.9	-862.8	17.100	9.800	-4.700	-4.077	4.566	0.596	2699.9	14.838	1.000	255.0
5000-AX- 4	14698.6	2323.9	-932.8	16.700	8.700	-5.100	-4.077	4.566	0.596	2659.9	14.980	1.000	255.0
5000-AX- 5	11538.8	2224.5	-756.7	16.761	10.425	-4.248	-4.077	4.566	0.596	2469.6	13.375	1.000	255.0
5000-AX- 6	11457.8	2[illegible]08.8	-741.4	16.672	10.295	-4.200	-4.077	4.566	0.596	2448.9	13.297	1.000	255.0
5000-AY- 1	11074.1	2056.8	-732.4	16.800	11.435	-4.285	-2.526	1.670	0.139	2297.2	12.036	1.000	270.0
5000-AY- 2	10459.5	1898.1	-655.5	16.500	11.130	-4.000	-2.526	1.670	0.139	2200.2	11.475	1.000	270.0
5000-AY- 3	8831.5	1581.7	-733.4	16.200	11.700	-4.800	-2.526	1.670	0.139	2008.9	10.290	1.000	270.0
5000-AY- 4	13141.0	2288.3	-921.6	17.000	10.900	-5.100	-2.526	1.670	0.139	2482.3	13.654	1.000	270.0
5000-AY- 5	11502.3	2188.4	-755.3	17.082	11.697	-4.208	-2.526	1.670	0.139	2375.4	12.471	1.000	270.0
5000-AY- 6	11490.2	2202.6	-745.8	17.139	11.814	-4.247	-2.526	1.670	0.139	2383.2	12.490	1.000	270.0
5000-AC- 1	11322.6	2097.1	-713.6	17.779	10.383	-3.128	-2.519	3.511	-0.392	2383.6	12.698	1.000	270.0
5000-AC- 2	9799.6	1777.9	-710.9	17.400	10.600	-3.400	-2.519	3.511	-0.392	2187.0	11.503	1.000	270.0
5000-AC- 3	8406.5	1466.4	-684.9	17.100	10.900	-3.700	-2.519	3.511	-0.392	1999.0	10.641	1.000	270.0
5000-AC- 4	9268.8	1553.7	-784.9	16.800	10.000	-4.100	-2.519	3.511	-0.392	2059.7	10.930	1.000	270.0
5000-AC- 5	11576.5	2151.7	-656.0	17.848	10.316	-2.816	-2.519	3.511	-0.392	2421.5	12.891	1.000	270.0
5000-AC- 6	11633.5	2236.6	-720.9	18.128	10.069	-3.069	-2.519	3.511	-0.392	2469.0	13.068	1.000	270.0
5000-AC- 7	11525.5	2214.5	-747.3	18.100	10.095	-3.200	-2.519	3.511	-0.392	2454.6	12.986	1.000	270.0

TABLE XVI. LIST OF COMPUTER RUNS FOR THE CTR-A3 CONFIGURATION. V = 160 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALPHA PAD		
CASE NO	FZ	FX	FY	A0S	B1S	A1S	D0S	E1S	D1C	HP	ALFA	RAD	AZM
500-A1- 1	13244.4	2381.7	-729.6	19.020	10.090	-1.051	-2.440	5.116	-1.201	2754.7	14.073	1.000	270.0
500-A1- 2	13595.0	2505.0	-848.0	19.300	10.300	-1.500	-2.440	5.116	-1.201	2828.3	14.416	1.000	270.0
500-A1- 3	12765.4	2233.0	-745.2	18.700	9.800	-2.000	-2.440	5.116	-1.201	2657.5	13.620	1.000	270.0
500-A1- 4	13987.0	2640.6	-802.0	19.600	10.600	-1.300	-2.440	5.116	-1.201	2510.3	14.737	1.000	270.0
500-A1- 5	9563.5	1754.7	-525.8	18.748	12.025	-3.484	-2.440	5.116	-1.201	2320.3	11.351	1.000	270.0
500-A1- 6	11444.2	2261.0	-815.1	19.402	11.660	-2.400	-2.440	5.116	-1.201	2630.1	13.266	1.000	270.0
500-A1- 7	11588.8	2223.5	-755.5	19.103	11.315	-2.055	-2.440	5.116	-1.201	2619.3	13.232	1.000	270.0
500-A1- 8	11433.2	2191.3	-735.8	19.160	11.222	-1.954	-2.440	5.116	-1.201	2593.7	13.131	1.000	270.0
500-A2- 1	13778.7	2511.1	-735.5	18.391	12.651	-3.888	-0.593	-0.572	-0.432	2589.3	12.885	1.000	285.0
500-A2- 2	13301.4	2353.2	-776.1	18.000	12.500	-4.100	-0.593	-0.572	-0.432	2497.5	12.350	1.000	285.0
500-A2- 3	15564.1	2647.1	-624.0	18.600	12.300	-3.700	-0.593	-0.572	-0.432	2725.7	14.960	1.000	285.0
500-A2- 4	10676.9	1953.2	-666.3	17.700	13.000	-3.300	-0.593	-0.572	-0.432	2243.6	10.352	1.000	285.0
500-A2- 5	11660.9	2148.3	-711.2	18.604	13.250	-3.742	-0.593	-0.572	-0.432	2357.5	11.054	1.000	285.0
500-A2- 6	11562.5	2220.0	-740.5	18.177	13.617	-3.858	-0.593	-0.572	-0.432	2380.5	11.201	1.000	285.0
500-A3- 1	12661.3	2124.5	-553.0	18.191	12.128	-7.574	0.331	-2.726	3.539	2547.9	11.260	1.000	315.0
500-A3- 2	14018.8	2280.5	-516.5	18.500	12.400	-6.100	0.331	-2.726	3.539	2673.6	12.521	1.000	315.0
500-A3- 3	10793.3	1812.9	-511.8	17.700	12.500	-7.500	0.331	-2.726	3.539	2353.5	9.641	1.000	315.0
500-A3- 4	13912.9	2374.0	-255.3	18.700	12.400	-6.900	0.331	-2.726	3.539	2701.6	12.329	1.000	315.0
500-A3- 5	11145.1	1971.4	-670.0	18.145	13.485	-7.900	0.331	-2.726	3.539	2437.4	10.000	1.000	315.0
500-A3- 6	11812.9	2422.1	-835.3	19.634	15.555	-8.510	0.331	-2.726	3.539	2661.8	11.231	1.000	315.0
500-A3- 7	11483.4	2208.4	-743.2	18.898	14.725	-8.201	0.331	-2.726	3.539	2553.8	10.777	1.000	315.0
500-A4- 1	12555.0	2131.0	-595.4	18.623	9.763	-10.030	-0.590	0.803	6.660	2818.1	10.202	1.000	345.0
500-A4- 2	11047.0	1851.8	-550.4	18.300	10.000	-5.700	-0.590	0.803	6.660	2616.6	9.055	1.000	345.0
500-A4- 3	9302.4	1443.1	-601.3	18.000	10.300	-5.500	-0.590	0.803	6.660	2387.5	7.668	1.000	345.0
500-A4- 4	13526.8	2307.5	-322.8	18.500	9.400	-5.600	-0.590	0.803	6.660	2931.8	10.554	1.000	345.0
500-A4- 5	9371.9	1441.5	-635.1	17.507	10.143	-5.657	-0.590	0.803	6.660	2389.5	7.734	1.000	345.0
500-A4- 6	9646.5	1636.6	-621.6	18.745	10.675	-5.530	-0.590	0.803	6.660	2479.7	8.141	1.000	345.0
500-A4- 7	12713.5	2669.5	-308.0	20.345	12.675	-10.247	-0.590	0.803	6.660	3079.5	10.650	1.000	345.0
500-A4- 8	11546.5	2188.1	-736.6	19.281	11.625	-10.175	-0.590	0.803	6.660	2801.2	9.637	1.000	345.0
500-A4- 9	11502.9	2206.8	-746.2	19.114	11.615	-10.185	-0.590	0.803	6.660	2808.8	9.622	1.000	345.0
500-A5- 1	18088.8	2365.2	-608.8	19.254	6.560	-7.995	-2.436	6.485	5.810	3018.5	11.522	1.000	240.0
500-A5- 2	19308.5	2602.8	-575.8	19.500	6.600	-8.200	-2.436	6.485	5.810	3184.5	12.259	1.000	240.0
500-A5- 3	14116.4	2694.2	-451.7	19.800	7.200	-7.600	-2.436	6.485	5.810	3216.4	12.416	1.000	240.0
500-A5- 4	13364.8	2294.6	-601.8	18.500	6.200	-8.100	-2.436	6.485	5.810	2596.0	11.571	1.000	240.0
500-A5- 5	11276.9	2105.3	-694.5	19.453	8.253	-6.069	-2.436	6.485	5.810	2819.8	10.600	1.000	240.0
500-A5- 6	11963.7	2408.6	-753.7	20.053	9.042	-8.468	-2.436	6.485	5.810	2987.5	11.222	1.000	240.0
500-A5- 7	11532.4	2214.2	-735.1	19.875	8.815	-8.281	-2.436	6.485	5.810	2876.5	10.825	1.000	240.0
500-A6- 1	13207.5	2423.4	-656.1	19.456	7.121	-3.900	-3.361	8.645	1.840	2990.5	13.455	1.000	255.0
500-A6- 2	13906.0	2631.5	-815.0	19.100	7.400	-3.600	-3.361	8.645	1.840	2734.8	12.458	1.000	255.0
500-A6- 3	14543.0	2625.8	-770.0	19.700	6.600	-4.200	-3.361	8.645	1.840	3153.1	13.963	1.000	255.0
500-A6- 4	10155.2	1707.3	-578.5	18.500	7.000	-3.300	-3.361	8.645	1.840	2543.1	11.634	1.000	255.0
500-A6- 5	11161.8	1928.2	-555.2	18.525	7.257	-4.025	-3.361	8.645	1.840	2675.7	12.262	1.000	255.0
500-A6- 6	11101.1	1912.3	-765.3	18.527	7.223	-4.061	-3.361	8.645	1.840	2662.8	12.175	1.000	255.0
500-A6- 7	13112.0	2795.0	-561.3	20.601	9.020	-3.218	-3.361	8.645	1.840	3161.7	14.054	1.000	255.0
500-A6- 8	11920.2	2344.5	-738.4	19.853	8.560	-4.028	-3.361	8.645	1.840	2504.2	13.045	1.000	255.0
500-A6- 9	11647.8	2273.4	-725.5	19.768	8.527	-4.000	-3.361	8.645	1.840	2961.8	12.871	1.000	255.0
500-A6-10	11523.4	2215.7	-745.0	19.654	8.517	-4.122	-3.361	8.645	1.840	2828.8	12.736	1.000	255.0

TABLE XVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0T	B1S	A1S	SERVO FLAP CONTROLS C0S	C1S	C1C	HP	ALFA RAD ALFA	RAD	AZM
500-A7- 1	13020.6	2385.8	-662.7	20.454	13.184	-4.024	2.066	-2.394	-0.099	2575.4	12.972	1.000	300.0
500-A7- 2	11516.0	2135.5	-646.6	20.300	13.400	-3.800	2.066	-2.394	-0.099	2404.5	11.379	1.000	300.0
500-A7- 3	12410.2	2105.4	-758.2	20.000	12.800	-4.400	2.066	-2.394	-0.099	2406.5	11.773	1.000	300.0
500-A7- 4	15099.4	2270.5	-655.6	20.500	12.500	-4.600	2.066	-2.394	-0.099	2648.0	15.417	1.000	300.0
500-A7- 5	10747.7	1910.1	-656.4	19.579	13.403	-3.654	2.066	-2.394	-0.099	2270.2	10.643	1.000	300.0
500-A7- 6	10793.8	1835.0	-672.4	19.479	12.526	-4.042	2.066	-2.394	-0.099	2234.3	10.381	1.000	300.0
500-A7- 7	11488.7	2268.3	-726.2	20.579	14.851	-3.991	2.066	-2.394	-0.099	2456.2	11.598	1.000	300.0
500-A7- 8	11678.4	2208.8	-744.2	20.770	14.554	-4.131	2.066	-2.394	-0.099	2425.4	11.510	1.000	300.0
500-A8- 1	13030.3	2451.4	-714.6	19.899	13.076	-3.979	1.179	-1.784	-0.210	2564.4	12.526	1.000	285.0
500-A8- 2	11051.0	2169.8	-642.7	19.900	13.300	-3.800	1.179	-1.788	-0.210	2384.6	11.125	1.000	300.0
500-A8- 3	12206.8	2151.5	-807.0	19.330	12.700	-3.500	1.179	-1.788	-0.210	2369.3	11.329	1.000	300.0
500-A8- 4	9798.1	1748.6	-720.7	19.000	13.600	-4.200	1.179	-1.788	-0.210	2138.0	9.388	1.000	300.0
500-A8- 5	11474.3	2227.1	-755.7	19.878	14.262	-4.040	1.179	-1.788	-0.210	2402.2	11.265	1.000	300.0
500-A8- 6	11978.1	2208.8	-745.4	19.810	14.125	-4.010	1.179	-1.788	-0.210	2393.6	11.233	1.000	300.0
500-A9- 1	13049.1	2503.3	-740.6	19.145	12.582	-3.934	0.293	-1.179	-0.321	2590.7	12.856	1.000	285.0
500-A9- 2	15500.0	2613.9	-745.9	19.400	12.600	-4.230	0.293	-1.179	-0.321	2725.4	14.593	1.000	285.0
500-A9- 3	11520.4	2147.8	-606.9	18.730	13.200	-3.300	0.293	-1.179	-0.321	2350.6	10.846	1.000	285.0
500-A9- 4	19798.6	1193.8	-2184.1	19.600	12.300	-13.400	0.293	-1.179	-0.321	2542.6	20.715	1.000	285.0
500-A9- 5	14902.0	2165.6	-2466.2	13.756	13.392	-11.400	0.293	-1.179	-0.321	2021.5	14.965	1.000	300.0
500-A9- 6	14316.9	2291.0	-2038.0	18.734	13.374	-9.400	0.293	-1.179	-0.321	2583.9	13.612	1.000	295.0
500-A9- 7	13636.7	2339.6	-1519.8	18.655	13.370	-7.400	0.293	-1.179	-0.321	2516.1	12.547	1.000	285.0
500-A9- 8	12331.5	2235.5	-1053.4	18.848	13.370	-5.400	0.293	-1.179	-0.321	2427.8	11.513	1.000	285.0
500-A9- 9	11419.7	2141.2	-793.6	18.687	13.480	-4.239	0.293	-1.179	-0.321	2351.3	10.590	1.000	300.0
500-A9-10	11390.6	2194.8	-782.2	18.577	14.008	-4.092	0.293	-1.179	-0.321	2373.6	10.931	1.000	300.0
500-A9-11	11529.5	2219.5	-746.8	18.553	13.878	-3.912	0.293	-1.179	-0.321	2386.5	11.020	1.000	300.0
500-AA- 1	13158.9	2334.0	-721.2	18.247	13.881	-3.204	-0.285	-1.750	-1.473	2499.2	13.444	1.000	285.0
500-AA- 2	14025.5	2393.4	-755.8	18.500	13.500	-3.600	-0.285	-1.750	-1.473	2610.5	15.234	1.000	285.0
500-AA- 3	13462.9	2234.5	-853.8	17.900	13.300	-3.900	-0.285	-1.750	-1.473	2469.1	13.605	1.000	285.0
500-AA- 4	14355.3	2510.7	-620.6	18.400	14.000	-2.900	-0.285	-1.750	-1.473	2647.7	15.090	1.000	285.0
500-AA- 5	11043.1	1998.7	-642.4	17.896	13.984	-3.103	-0.285	-1.750	-1.473	2268.7	11.499	1.000	295.0
500-AA- 6	11088.1	2001.9	-681.0	17.744	14.044	-3.106	-0.285	-1.750	-1.473	2270.2	11.535	1.000	265.0
500-AA- 7	12012.9	2382.2	-751.9	18.718	15.335	-3.173	-0.285	-1.750	-1.473	2492.9	12.778	1.000	285.0
500-AA- 8	11931.3	2173.9	-742.2	18.226	14.743	-3.252	-0.285	-1.750	-1.473	2372.2	12.060	1.000	285.0
500-AA- 9	11534.5	2211.3	-740.4	18.314	14.500	-3.248	-0.285	-1.750	-1.473	2393.5	12.185	1.000	285.0
500-AB- 1	11062.7	2091.4	-705.4	16.954	11.034	-1.866	-4.694	6.517	-1.556	2514.9	14.147	1.000	270.0
500-AB- 2	9993.5	1784.9	-575.9	16.700	11.300	-1.500	-4.694	6.517	-1.556	2295.9	13.127	1.000	255.0
500-AB- 3	10949.4	2059.7	-586.9	17.200	11.600	-1.300	-4.694	6.517	-1.556	2475.7	13.922	1.000	255.0
500-AB- 4	9593.0	1686.7	-675.6	16.100	10.700	-2.100	-4.694	6.517	-1.556	2254.2	13.002	1.000	270.0
500-AB- 5	11433.6	2161.6	-754.1	17.040	10.528	-2.050	-4.694	6.517	-1.556	2564.7	14.345	1.000	255.0
500-AB- 6	12010.0	2650.0	-773.9	15.491	13.171	-1.929	-4.694	6.517	-1.556	2654.7	15.303	1.000	255.0
500-AB- 7	11511.0	2213.1	-748.3	17.239	11.211	-1.988	-4.694	6.517	-1.556	2594.0	14.418	1.000	255.0
500-AC- 1	11202.3	2173.6	-740.7	16.468	13.660	-3.016	-2.983	1.142	-0.578	2397.8	12.075	1.000	285.0
500-AC- 2	9252.9	1775.6	-562.3	16.100	13.900	-3.400	-2.983	1.142	-0.578	2153.7	10.716	1.000	285.0
500-AC- 3	13437.7	2440.5	-820.1	16.700	13.000	-4.100	-2.983	1.142	-0.578	2605.4	13.760	1.000	270.0
500-AC- 4	9139.3	1681.8	-613.8	15.800	13.500	-3.500	-2.983	1.142	-0.578	2104.8	10.513	1.000	285.0
500-AC- 5	11519.5	2220.5	-765.7	16.519	13.627	-3.929	-2.983	1.142	-0.578	2431.6	12.288	1.000	285.0
500-AD- 1	12052.0	2347.1	-755.9	16.644	13.512	-8.165	-2.256	-0.609	3.569	2584.7	10.099	1.000	330.0
500-AD- 2	10126.1	1970.4	-715.7	[illegible]	13.870	-7.830	-2.256	-0.609	3.569	2355.1	8.724	1.000	330.0
500-AD- 3	13634.7	2579.3	-833.0	16.900	13.200	-8.400	-2.256	-0.609	3.569	2749.5	11.325	1.000	285.0
500-AD- 4	14461.4	2647.5	-794.5	17.100	13.030	-8.200	-2.256	-0.609	3.569	2861.1	12.135	1.000	285.0
500-AD- 5	11540.9	2255.5	-762.3	16.547	13.561	-7.931	-2.256	-0.609	3.569	2527.7	9.734	1.000	330.0
500-AD- 6	11522.8	2246.4	-756.5	16.529	13.534	-7.958	-2.256	-0.609	3.569	2522.8	9.678	1.000	330.0
500-AD- 7	11530.8	2225.4	-765.5	16.654	13.383	-7.948	-2.256	-0.609	3.569	2512.2	9.644	1.000	330.0

TABLE XVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	BES	A1S	SERVO FLAP CONTROLS DOS	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
500-AE- 1	12449.7	2459.8	-738.8	17.335	10.742	-10.360	-3.239	3.008	6.736	2877.6	10.838	1.000	225.0
500-AE- 2	13687.3	2658.9	-746.4	17.600	10.400	-10.700	-3.239	3.008	6.736	3026.0	11.362	1.000	225.0
500-AE- 3	10984.2	2136.4	-690.4	17.000	10.900	-10.000	-3.239	3.008	6.736	2670.9	10.031	1.000	225.0
500-AE- 4	13638.2	2670.4	-687.8	17.500	10.200	-10.500	-3.239	3.008	6.736	3009.7	11.358	1.000	225.0
500-AE- 5	11637.5	2334.3	-767.6	17.213	10.858	-10.398	-3.239	3.008	6.736	2793.6	10.506	1.000	225.0
500-AE- 6	11657.7	2267.8	-768.0	17.086	10.760	-10.420	-3.239	3.008	6.736	2755.5	10.391	1.000	225.0
500-AE- 7	11556.[illegible]	2226.2	-747.5	16.983	10.656	-10.332	-3.239	3.008	6.736	2735.3	10.312	1.000	225.0
500-AF- 1	12206.0	2455.5	-758.5	17.852	8.117	-8.313	-4.950	8.381	5.757	3021.1	13.017	1.000	240.0
500-AF- 2	10231.9	1950.0	-710.8	17.400	8.400	-8.100	-4.950	8.381	5.757	2698.4	11.998	1.000	240.0
500-AF- 3	10372.6	1895.1	-798.8	17.100	7.500	-8.600	-4.950	8.381	5.757	2675.1	11.921	1.000	240.0
500-AF- 4	11651.0	2476.6	-704.2	18.100	8.700	-8.000	-4.950	8.381	5.757	3017.1	12.993	1.000	225.0
500-AF- 5	11570.3	2256.6	-742.8	17.516	7.509	-8.272	-4.950	8.381	5.757	2899.7	12.731	1.000	240.0
500-AF- 6	11462.7	2194.7	-744.1	17.384	7.735	-8.308	-4.950	8.381	5.757	2962.0	12.642	1.000	240.0
500-Z2- 1	10899.3	2012.3	-714.0	21.883	14.210	-4.355	3.157	-2.559	0.408	2435.2	10.409	1.000	300.0
500-Z2- 2	8630.5	1487.8	-634.5	21.500	14.600	-4.100	3.157	-2.559	0.408	2138.3	8.751	1.000	300.0
500-Z2- 3	9537.8	1642.6	-728.7	21.300	13.900	-4.600	3.157	-2.559	0.408	2229.0	9.282	1.000	300.0
500-Z2- 4	5833.8	736.2	-500.2	21.000	14.900	-3.800	3.157	-2.559	0.408	1738.1	6.721	1.000	315.0
500-Z2- 5	11465.2	2137.8	-731.8	22.036	14.226	-4.393	3.157	-2.559	0.408	2512.8	10.872	1.000	300.0
500-Z2- 6	11928.3	1980.5	-775.9	21.223	12.644	-4.820	3.157	-2.559	0.408	2449.1	10.722	1.000	300.0
500-Z2- 7	11404.5	2193.4	-737.1	22.291	14.682	-4.368	3.157	-2.559	0.408	2533.7	10.934	1.000	300.0
500-Z2- 8	11524.3	2216.2	-745.0	22.309	14.669	-4.414	3.157	-2.559	0.408	2546.3	11.031	1.000	300.0
500-Z3- 1	10112.9	1858.7	-650.2	21.372	16.473	-2.547	3.953	-5.539	-2.200	2237.0	12.164	1.000	300.0
500-Z3- 2	8672.6	1568.5	-560.0	21.100	16.700	-2.200	3.953	-5.539	-2.200	2065.6	10.926	1.000	300.0
500-Z3- 3	11467.1	2051.0	-656.8	21.600	16.100	-2.800	3.953	-5.539	-2.200	2371.9	13.521	1.000	300.0
500-Z3- 4	12990.7	2180.3	-723.2	21.500	15.800	-3.100	3.953	-5.539	-2.200	2513.6	15.531	1.000	300.0
500-Z3- 5	11587.8	2043.8	-685.2	21.539	15.517	-2.792	3.953	-5.539	-2.200	2371.1	13.618	1.000	300.0
500-Z3- 6	11608.3	2052.6	-690.7	21.572	15.562	-2.796	3.953	-5.539	-2.200	2376.2	13.652	1.000	300.0
500-Z3- 7	11516.7	2227.0	-744.2	22.291	17.301	-2.907	3.953	-5.539	-2.200	2466.3	13.998	1.000	300.0
500-Z4- 1	8187.1	1417.9	-501.0	20.861	18.737	-0.738	4.748	-8.518	-4.808	2018.6	12.491	1.000	300.0
500-Z4- 2	7822.7	1295.6	-516.1	20.500	18.400	-1.000	4.748	-8.518	-4.808	1953.2	12.000	1.000	300.0
500-Z4- 3	5950.6	919.0	-355.7	20.300	18.900	-0.400	4.748	-8.518	-4.808	1747.1	10.432	1.000	300.0
500-Z4- 4	5979.9	881.5	-445.5	20.000	18.600	-1.300	4.748	-8.518	-4.808	1732.7	10.450	1.000	300.0
500-Z4- 5	11060.7	1916.1	-718.3	22.010	15.110	-1.709	4.748	-8.518	-4.808	2388.0	16.759	1.000	300.0
500-Z4- 6	10550.3	1644.7	-597.8	20.996	17.554	-1.263	4.748	-8.518	-4.808	2216.7	15.457	1.000	300.0
500-Z4- 7	12405.9	2033.8	-625.5	23.081	19.554	-1.478	4.748	-8.518	-4.808	2595.8	20.440	1.000	300.0
500-Z4- 8	11730.2	2380.4	-795.6	23.506	21.816	-1.813	4.748	-8.518	-4.838	2698.8	19.095	1.000	300.0
500-Z4- 9	11585.7	2213.9	-747.7	23.253	20.820	-1.678	4.748	-8.518	-4.808	2596.5	18.299	1.000	300.0
500-Z4-10	11521.3	2206.2	-745.3	23.117	20.672	-1.670	4.748	-8.518	-4.808	2573.5	18.048	1.000	300.0
500-Z5- 1	9590.4	1951.7	-20.4	18.022	13.652	0.0	-1.263	0.218	-0.237	2241.6	9.891	1.000	285.0
500-Z5- 2	13680.5	2604.8	-326.9	18.300	13.250	-4.300	-1.263	0.218	-0.237	2648.3	13.146	1.000	285.0
500-Z5- 3	15409.2	2758.8	-848.5	18.600	12.900	-4.600	-1.263	0.218	-0.237	2810.5	14.815	1.000	285.0
500-Z5- 4	10994.7	2201.7	-656.5	18.000	13.900	-3.700	-1.263	0.218	-0.237	2379.1	11.187	1.000	285.0
500-Z5- 5	11601.2	2332.8	-791.3	18.109	13.890	-4.130	-1.263	0.218	-0.237	2454.0	11.703	1.000	285.0
500-Z5- 6	11572.2	2260.9	-778.3	17.912	13.570	-4.123	-1.263	0.218	-0.237	2415.5	11.388	1.000	285.0
500-Z5- 7	11517.4	2222.9	-747.2	17.802	13.366	-4.002	-1.263	0.218	-0.237	2394.5	11.296	1.000	285.0
500-Z6- 1	8872.8	1556.6	-602.0	13.651	15.358	-1.953	-4.888	0.015	-3.490	2091.6	12.602	1.000	285.0
500-Z6- 2	7171.0	1210.9	-466.3	13.300	15.600	-1.570	-4.888	0.015	-3.490	1888.3	11.465	1.000	285.0
500-Z6- 3	10380.4	1790.4	-688.0	13.900	15.000	-2.200	-4.888	0.015	-3.490	2246.4	13.756	1.000	285.0
500-Z6- 4	5569.7	840.1	-340.5	13.000	15.900	-1.300	-4.888	0.015	-3.490	1683.7	10.356	1.000	285.0
500-Z6- 5	11456.8	1832.0	-634.0	13.936	14.771	-1.920	-4.888	0.015	-3.490	2325.5	14.520	1.000	285.0
500-Z6- 6	11309.9	1939.6	-688.3	14.172	14.880	-2.146	-4.888	0.015	-3.490	2357.7	14.587	1.000	285.0
500-Z6- 7	11537.8	2301.8	-720.4	15.447	16.55[illegible]	-2.407	-4.888	0.015	-3.490	2578.[illegible]	15.292	1.000	285.0
500-Z6- 8	11539.4	2210.6	-746.8	15.322	16.441	-2.289	-4.888	0.015	-3.490	2521.3	15.123	1.000	285.0

TABLE XVI - Continued

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	A0S	B1S	A1S	D0S	C1S	D1C	HP	ALFA	RAD	AZM
500-27- 1	10141.9	1801.8	-686.3	10.812	10.273	-5.273	-10.899	0.751	1.081	2456.4	14.249	1.000	240.0
500-27- 2	8851.9	1596.2	-572.6	10.500	10.600	-4.900	-10.899	0.751	1.081	2307.0	14.169	1.000	240.0
500-27- 3	11253.2	1944.3	-763.3	11.100	9.900	-5.500	-10.899	0.751	1.081	2586.0	14.641	0.890	225.0
500-27- 4	7922.2	1412.8	-483.4	10.300	10.800	-4.700	-10.899	0.751	1.081	2186.7	14.133	1.000	240.0
500-27- 5	10713.1	1849.9	-625.9	10.814	5.564	-4.974	-10.899	0.751	1.081	2519.2	14.550	0.890	225.0
500-27- 6	10198.0	1580.4	-534.1	9.965	8.566	-4.476	-10.899	0.751	1.081	2340.3	14.257	0.890	225.0
500-27- 7	11612.0	2221.4	-755.5	12.025	11.293	-5.444	-10.899	0.751	1.081	2749.8	14.764	0.890	225.0
500-27- 8	11659.2	2205.3	-765.2	11.566	11.112	-5.402	-10.899	0.751	1.081	2744.4	14.792	0.850	225.0
500-28- 1	9163.6	1543.9	-614.2	10.201	12.537	-3.465	-10.104	5.772	-1.527	2277.8	14.565	1.000	255.0
500-28- 2	7742.7	1263.3	-490.6	10.000	12.800	-3.100	-10.104	5.7[illegible]	-1.527	2108.9	13.899	1.000	255.0
500-28- 3	10340.7	1740.1	-697.3	10.690	12.300	-3.700	-10.104	5.772	-1.527	2408.8	15.047	1.000	255.0
500-28- 4	11381.0	1815.0	-761.4	10.900	12.000	-3.920	-10.104	5.772	-1.527	2506.3	15.253	1.000	255.0
500-28- 5	9663.8	1683.7	-621.5	10.752	13.090	-3.364	-10.104	5.772	-1.527	2365.6	14.757	1.000	255.0
500-28- 6	11008.9	2099.7	-697.9	11.950	13.508	-3.471	-10.104	5.772	-1.527	2657.6	15.430	1.000	255.0
500-28- 7	11249.3	2079.2	-744.6	11.872	13.627	-3.701	-10.104	5.772	-1.527	2656.1	15.455	1.000	255.0
500-28- 8	11442.1	2202.5	-741.4	12.336	14.164	-3.526	-10.104	5.772	-1.527	2737.0	15.566	1.000	255.0
500-29- 1	7509.4	1083.4	-522.1	9.790	14.801	-1.656	-9.309	2.792	-4.135	2068.8	14.028	1.000	270.0
500-29- 2	6022.5	775.9	-353.4	9.500	15.100	-1.300	-9.309	2.792	-4.135	1897.0	12.915	1.000	270.0
500-29- 3	6610.2	792.8	-477.3	9.200	14.500	-1.900	-9.309	2.792	-4.135	1902.7	13.041	1.000	270.0
500-29- 4	9139.1	1345.2	-652.2	10.000	14.300	-2.100	-9.309	2.792	-4.135	2233.2	15.182	1.000	270.0
500-29- 5	11035.9	1851.0	-577.2	11.792	15.730	-1.119	-9.309	2.792	-4.135	2590.8	17.131	1.000	270.0
500-29- 6	10939.6	1858.0	-510.8	11.775	15.758	-0.767	-9.309	2.792	-4.135	2585.9	17.029	1.000	270.0
500-29- 7	12136.1	2338.6	-592.7	13.775	17.758	-1.113	-9.309	2.792	-4.135	2919.9	18.360	1.000	270.0
500-29- 8	11973.4	2244.5	-633.5	13.496	17.677	-2.278	-9.309	2.792	-4.135	2903.9	18.211	1.000	270.0
500-29- 9	11533.2	2218.7	-733.4	13.256	17.460	-1.766	-9.309	2.792	-4.135	2847.9	17.917	1.000	270.0
500-29-10	11649.7	2208.4	-744.9	13.221	17.650	-1.925	-9.309	2.792	-4.135	2841.3	17.894	1.000	270.0
500-2A- 1	11692.6	2242.3	-770.3	19.712	5.655	-7.372	-1.808	5.015	4.583	2788.3	9.642	1.000	240.0
500-2A- 2	9609.1	1750.7	-678.7	19.400	9.500	-6.905	-1.808	5.015	4.583	2510.0	8.270	1.000	240.0
500-2A- 3	10115.4	1786.9	-792.5	19.100	9.300	-7.600	-1.808	5.015	4.583	2526.7	8.428	1.000	240.0
500-2A- 4	13937.6	2728.4	-837.4	20.000	9.000	-7.900	-1.808	5.015	4.583	3112.1	11.296	1.000	255.0
500-2A- 5	11571.1	2261.4	-745.5	19.714	5.644	-7.283	-1.808	5.015	4.583	2799.8	9.758	1.000	240.0
500-2A- 6	11463.1	2198.0	-752.2	19.563	9.418	-7.319	-1.808	5.015	4.583	2767.1	9.594	1.000	240.0
500-22- 1	10856.0	1951.2	-740.0	22.393	11.546	-6.163	2.362	0.420	3.015	2609.1	8.130	1.000	330.0
500-22- 2	12511.7	2300.6	-737.4	22.630	11.500	-6.300	2.362	0.420	3.015	2821.7	9.228	1.000	330.0
500-22- 3	7812.2	1102.8	-645.8	21.600	12.200	-5.900	2.362	0.420	3.015	2111.8	5.197	1.000	315.0
500-22- 4	5839.6	460.3	-537.9	21.510	12.400	-5.600	2.362	0.420	3.015	1782.7	4.551	0.300	120.0
500-22- 5	11979.2	2131.0	-712.6	22.273	11.176	-6.137	2.362	0.420	3.015	2727.2	8.746	1.000	330.0
500-22- 6	12813.7	2782.8	-942.8	24.113	14.173	-6.952	2.362	0.420	3.015	3376.5	9.959	1.000	315.0
500-22- 7	12271.4	2657.5	-971.9	24.014	14.301	-7.336	2.362	0.420	3.015	2993.6	9.550	1.000	315.0
500-22- 8	11855.0	2420.8	-251.6	21.471	11.341	-6.561	2.362	0.420	3.015	2857.3	9.057	1.000	330.0
500-22- 9	7184.5	388.0	-432.0	21.421	11.341	-4.561	2.362	0.420	3.015	2014.0	5.193	0.300	120.0
500-22-10	11762.8	2327.2	-764.6	23.114	12.763	-6.192	2.362	0.420	3.015	2810.0	8.451	1.000	330.0
500-22-11	11665.2	2186.5	-738.4	22.937	12.410	-6.390	2.362	0.420	3.015	2733.4	8.554	1.000	330.0
500-22-12	11634.0	2166.4	-732.6	22.798	12.354	-6.068	2.362	0.420	3.015	2724.2	8.531	1.000	330.0
500-22-13	11535.7	2213.1	-744.4	22.895	12.493	-6.118	2.362	0.420	3.015	2748.3	8.617	1.000	330.0

TABLE XVII. LIST OF COMPUTER RUNS FOR THE 5- AND 6-BLADED DCR-a CONFIGURATION

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	C1S	D1C	HP	ALFA VAR ALFA	RAD	AZM
550-A1- 1	-621.2	-2608.1	-26.7	15.000	14.000	-20.000	0.0	0.0	0.0	825.0	3.249	1.000	310.0
550-A2- 1	15190.1	3709.3	-3157.2	24.000	14.000	-20.000	0.0	0.0	0.0	5814.7	20.943	1.000	310.0
550-A3- 1	13447.7	3291.5	-2934.5	21.900	14.200	-18.300	0.0	0.0	0.0	4797.0	16.388	1.000	315.0
550-A3- 2	13241.4	3130.2	-2791.6	21.330	13.800	-17.600	0.0	0.0	0.0	4565.2	15.523	1.000	315.0
550-A3- 3	13435.1	3233.0	-2884.3	21.630	14.000	-18.000	0.0	0.0	0.0	4673.2	15.975	1.000	315.0
550-A3- 4	13560.5	3426.7	-2767.3	22.100	14.550	-17.600	0.0	0.0	0.0	4838.4	16.728	1.000	315.0
550-A3- 5	12143.3	2886.8	-2285.6	20.635	14.115	-15.800	0.0	0.0	0.0	4168.2	13.848	1.000	315.0
550-A3- 6	11749.5	2630.9	-1785.4	20.367	14.308	-13.800	0.0	0.0	0.0	4008.5	13.377	1.000	315.0
550-A3- 7	11542.0	2905.2	-1347.1	20.353	14.727	-11.972	0.0	0.0	0.0	3967.1	13.260	1.000	315.0
550-A3- 8	11415.5	2853.5	-1321.8	20.296	14.736	-11.975	0.0	0.0	0.0	3927.4	13.094	1.000	315.0
551-A1- 1	11208.1	2742.9	-2445.4	21.900	14.200	-18.300	0.0	0.0	0.0	3997.5	16.388	1.000	315.0
551-A1- 2	11036.5	2608.5	-2326.4	21.300	13.800	-17.600	0.0	0.0	0.0	3804.3	15.523	1.000	315.0
551-A1- 3	11148.0	2694.2	-2403.6	21.600	14.000	-18.000	0.0	0.0	0.0	3894.3	15.975	1.000	315.0
551-A1- 4	[illegible]	2855.6	-2322.7	22.100	14.550	-17.400	0.0	0.0	0.0	4057.0	16.728	1.000	315.0
551-A1- 5	10227.9	2250.1	-1944.5	20.100	13.179	-15.800	0.0	0.0	0.0	3371.3	13.541	1.000	315.0
551-A1- 6	8233.9	1554.2	-1423.9	18.890	12.572	-13.800	0.0	0.0	0.0	2798.1	11.054	1.000	315.0
551-A1- 7	8573.2	1718.2	-1154.8	18.627	12.623	-11.960	0.0	0.0	0.0	2874.5	11.558	1.000	315.0
551-A1- 8	7533.1	1306.0	-1101.5	18.444	12.812	-12.137	0.0	0.0	0.0	2598.7	10.287	1.000	315.0
551-A1- 9	8461.3	1574.6	-1157.5	18.658	12.597	-12.079	0.0	0.0	0.0	2795.5	11.121	1.000	315.0
551-A1-10	7936.0	1615.2	-1121.8	18.537	12.755	-12.107	0.0	0.0	0.0	2668.2	10.588	1.000	315.0
551-A1-11	8378.2	1569.1	-1151.1	18.637	12.645	-12.044	0.0	0.0	0.0	2751.9	10.977	1.000	315.0
551-A2- 1	11912.4	3235.0	-1795.4	22.500	15.000	-15.300	0.0	0.0	0.0	4222.0	18.081	1.000	315.0
551-A2- 2	12456.8	3662.1	-1820.5	23.500	15.300	-15.600	0.0	0.0	0.0	4611.0	19.566	1.000	330.0
551-A2- 3	12654.2	3599.5	-1427.4	23.600	15.800	-15.000	0.0	0.0	0.0	4722.1	20.784	1.000	330.0
551-A2- 4	12551.6	3731.0	-1308.5	24.100	16.100	-15.800	0.0	0.0	0.0	4808.6	21.042	1.000	330.0
551-A2- 5	13494.0	3224.0	-1487.8	23.288	13.469	-15.178	0.0	0.0	0.0	4697.8	21.654	1.000	330.0
551-A2- 6	13741.7	3226.9	-1494.3	23.678	13.259	-15.516	0.0	0.0	0.0	4813.9	22.395	1.000	330.0
551-A2- 7	13784.8	3247.8	-1523.0	23.870	13.327	-15.845	0.0	0.0	0.0	4914.0	22.875	1.000	330.0
552-A1- 1	16155.6	3047.2	-1090.8	15.000	9.800	-8.000	0.0	0.0	0.0	3376.2	12.632	1.000	300.0
552-A1- 2	17325.9	3242.4	-1205.8	16.250	9.300	-8.400	0.0	0.0	0.0	3518.7	13.569	1.000	315.0
552-A1- 3	16445.9	2944.1	-1300.6	15.870	9.000	-8.600	0.0	0.0	0.0	3355.8	12.710	1.000	330.0
552-A1- 4	15176.2	2325.7	-1075.4	15.400	9.400	-7.900	0.0	0.0	0.0	3206.1	11.792	1.000	300.0
552-A1- 5	13337.5	1775.8	-702.3	14.643	9.852	-6.768	0.0	0.0	0.0	2587.4	8.650	1.000	300.0
552-A1- 6	8930.2	1075.5	-555.5	13.565	8.543	-6.403	0.0	0.0	0.0	2212.9	7.179	1.000	300.0
552-A1- 7	11533.6	2268.1	-737.0	15.325	10.944	-6.339	0.0	0.0	0.0	2811.0	9.572	1.000	300.0
552-A1- 8	11474.9	2219.0	-751.6	15.366	10.860	-6.947	0.0	0.0	0.0	2803.0	9.507	1.000	300.0
553-A1- 1	12646.9	2355.6	-858.2	15.600	9.400	-7.900	0.0	0.0	0.0	2671.1	11.752	1.000	300.0
553-A1- 2	[illegible]	2581.0	-905.0	16.000	9.800	-8.000	0.0	0.0	0.0	2813.5	12.632	1.000	300.0
553-A1- 3	13726.9	2736.7	-1083.9	15.900	9.000	-6.600	0.0	0.0	0.0	2776.5	12.710	1.000	300.0
553-A1- 4	15628.3	2702.0	-1008.1	16.250	9.300	-8.400	0.0	0.0	0.0	2531.9	13.565	1.000	315.0
553-A1- 5	13344.0	2605.0	-897.0	16.156	9.225	-7.941	0.0	0.0	0.0	2813.5	13.072	1.000	300.0
554-A1- 1	17111.4	1780.6	43.2	9.700	4.100	-1.300	0.0	0.0	0.0	1804.4	7.631	0.570	285.0
554-A1- 2	17521.4	1904.9	153.0	9.500	4.400	-1.000	0.0	0.0	0.0	1849.1	7.893	0.510	285.0
554-A1- 3	14622.8	1641.5	-120.4	9.400	4.700	-1.800	0.0	0.0	0.0	1725.8	6.420	1.000	295.0
554-A1- 4	17781.6	2041.4	20.0	10.200	5.000	-1.500	0.0	0.0	0.0	1927.1	8.098	1.000	285.0
554-A1- 5	11393.5	1140.8	-12.6	8.602	4.412	-1.184	0.0	0.0	0.0	1501.9	4.773	1.000	285.0
554-A1- 6	11501.4	1190.0	12.0	8.693	4.585	-1.078	0.0	0.0	0.0	1521.4	4.863	1.000	285.0
554-A1- 7	11531.4	1201.4	27.9	8.718	4.649	-1.004	0.0	0.0	0.0	1524.7	4.874	1.000	285.0
554-A1- 8	11505.2	1201.5	25.2	8.714	4.643	-0.998	0.0	0.0	0.0	1524.8	4.870	1.000	285.0

CASE NO.	NO. OF BLADES	V FLIGHT SPEED KTS
550-A1,A2,A3	6	180
551-A1	6	180
551-A2	5	180
552-A1	6	160
553-A1	5	160
554-A1	6	120

TABLE XVIII. LIST OF COMPUTER RUNS FOR THE CTR-B2 CONFIGURATION. V = 160 KTS

				PITCH HORN CONTROLS			STAVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	A0S	B1S	A1S	C0S	C1S	C1C	HP	ALFA	RAD	AZM
600-A1- 1	2258.1	313.8	-311.3	18.565	16.427	-3.739	-0.872	0.576	-1.476	1157.8	8.379	1.000	285.0
600-A1- 2	4851.7	-174.7	-116.5	19.169	16.300	-3.166	-0.872	0.596	-1.476	1122.3	7.582	1.000	285.0
600-A1- 3	2229.5	339.7	-284.1	18.600	16.500	-3.339	-0.872	0.596	-1.476	1153.0	8.365	1.000	285.0
600-A1- 4	2762.1	498.8	-371.4	18.500	16.850	-3.570	-0.872	0.596	-1.476	1440.4	8.748	1.000	285.0
600-A1- 5	245.8	-451.2	-22.1	16.500	14.850	-4.069	-0.872	0.576	-1.476	551.9	6.636	1.000	285.0
600-A1- 6	6547.5	1835.9	-831.9	18.900	12.850	-2.069	-0.872	0.596	-1.476	2049.0	11.862	1.000	285.0
600-A1- 7	8208.7	992.8	-664.3	16.815	10.850	-4.237	-0.872	0.596	-1.476	1621.5	9.513	1.000	285.0
600-A1- 8	9507.0	1675.4	-542.1	16.526	8.850	-2.256	-0.872	0.576	-1.476	1903.9	11.661	1.000	285.0
600-A1- 9	11674.9	1845.6	-556.6	17.652	8.743	-1.737	-0.872	0.596	-1.476	2131.6	13.263	1.000	285.0
600-A1-10	14762.4	2318.9	-995.4	19.652	10.743	-3.737	-0.872	0.596	-1.476	2514.3	17.295	1.000	285.0
600-A1-11	11626.1	2475.5	-770.3	19.782	12.685	-2.370	-0.872	0.576	-1.476	2465.4	14.339	1.000	285.0
600-A1-12	11593.9	2285.1	-762.5	19.279	11.651	-2.471	-0.872	0.596	-1.476	2383.7	14.055	1.000	285.0
600-A1-13	11465.4	2202.8	-745.6	19.007	11.426	-2.395	-0.872	0.596	-1.476	2333.8	13.828	1.000	285.0
600-A2- 1	7669.1	1708.3	-723.4	19.328	12.988	-2.778	-1.482	2.491	-1.038	2062.9	11.443	1.000	270.0
600-A2- 2	9131.5	2028.5	-860.0	19.500	12.400	-3.100	-1.482	2.491	-1.038	2260.2	12.471	1.000	270.0
600-A2- 3	9782.6	2104.1	-891.7	19.700	12.900	-3.100	-1.482	2.491	-1.038	2350.9	12.953	1.000	270.0
600-A2- 4	10798.0	2341.6	-566.4	19.900	12.200	-3.330	-1.482	2.491	-1.038	2464.2	13.628	1.000	270.0
600-A2- 5	12078.6	3035.2	-904.9	21.742	14.487	-2.521	-1.482	2.491	-1.038	2879.7	15.714	1.000	270.0
600-A2- 6	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2- 7	12083.7	3010.3	-905.3	21.742	14.487	-2.523	-1.482	2.491	-1.038	2883.1	15.715	1.000	270.0
600-A2- 8	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2- 9	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-10	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-11	12083.7	3010.3	-905.3	21.742	14.487	-2.523	-1.482	2.491	-1.038	2883.1	15.715	1.000	270.0
600-A2-12	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-13	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-14	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-15	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-16	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.412	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-17	12083.7	3010.3	-905.3	21.192	14.497	-2.523	-1.632	2.491	-1.038	2883.1	15.715	1.000	270.0
600-A2-18	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-19	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.098	2893.1	15.715	1.000	270.0
600-A2-20	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-21	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-22	14354.6	3544.3	-1346.5	23.792	16.497	-4.523	-1.482	2.491	-1.038	3362.9	18.462	1.000	270.0
600-A2-23	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.432	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-24	14354.6	3544.3	-1346.5	23.742	16.497	-4.523	-1.482	2.491	-1.088	3382.9	18.462	1.000	270.0
600-A2-25	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-26	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-27	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.088	2883.1	15.715	1.000	270.0
600-A2-28	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A2-29	12083.7	3010.3	-905.3	21.782	14.487	-2.523	-1.482	2.491	-1.038	2880.1	15.715	1.000	270.0
600-A2-30	14354.6	3544.3	-1346.5	23.782	16.487	-4.523	-1.482	2.491	-1.038	3382.9	18.462	1.000	270.0
600-A3- 1	8102.2	1660.8	-757.7	19.223	14.576	-3.450	-1.067	1.139	-0.684	2116.1	11.258	1.000	285.0
600-A3- 2	8503.5	1939.9	-734.7	19.400	13.700	-3.200	-1.067	1.139	-0.684	2163.5	11.507	1.000	285.0
600-A3- 3	8770.6	2074.9	-831.5	19.600	13.500	-3.600	-1.067	1.139	-0.684	2242.4	11.924	1.000	285.0
600-A3- 4	10635.7	2373.8	-925.3	19.800	13.300	-3.400	-1.067	1.139	-0.684	2424.8	13.134	1.000	285.0
600-A3- 5	11653.5	2251.5	-733.5	18.899	10.781	-2.899	-1.067	1.139	-0.684	2358.3	13.257	1.000	285.0
600-A3- 6	11460.6	2211.1	-765.3	18.807	10.784	-3.084	-1.067	1.139	-0.684	2339.1	13.087	1.000	285.0
500-A3- 7	11449.4	2212.1	-746.8	18.801	10.727	-2.991	-1.067	1.139	-0.684	2334.1	13.100	1.000	285.0

TABLE XVIII - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	C1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
600-44- 1	8024.1	1858.5	-745.1	19.128	14.053	-4.308	-0.667	-0.076	-0.035	2115.8	10.567	1.000	285.0
600-44- 2	8251.1	1924.6	-740.1	19.300	14.200	-4.100	-0.667	-0.076	-0.035	2157.9	10.775	1.000	285.0
600-44- 3	8435.5	2008.4	-728.8	19.500	14.400	-3.900	-0.667	-0.076	-0.035	2206.4	10.981	1.000	285.0
600-44- 4	10407.1	2313.5	-501.1	19.700	13.900	-4.500	-0.667	-0.076	-0.035	2429.3	12.333	1.000	285.0
600-44- 5	13057.5	2545.5	-385.3	19.352	11.086	-2.162	-0.667	-0.076	-0.035	2529.4	13.891	1.000	285.0
600-44- 6	11517.1	2230.9	-848.2	18.735	11.440	-4.340	-0.667	-0.076	-0.035	2357.1	12.434	1.000	285.0
600-44- 7	11517.1	2238.9	-761.3	18.733	11.330	-3.936	-0.667	-0.076	-0.035	2354.5	12.436	1.000	285.0
600-44- 8	11464.9	2202.9	-740.7	18.614	11.115	-3.859	-0.667	-0.076	-0.035	2332.9	12.351	1.000	285.0
600-45- 1	8239.5	1904.2	-754.5	18.503	13.516	-3.415	-2.009	1.740	-0.784	2150.6	11.817	1.000	270.0
600-45- 2	9218.9	2121.4	-831.9	18.700	13.300	-3.600	-2.009	1.740	-0.784	2279.3	12.548	1.000	270.0
600-45- 3	9332.1	2117.7	-893.6	18.500	13.700	-3.900	-2.009	1.740	-0.784	2311.9	12.683	1.000	270.0
600-45- 4	10928.1	2426.2	-582.8	19.100	13.150	-4.100	-2.009	1.740	-0.784	2479.8	13.822	1.000	285.0
600-45- 5	11610.3	2271.7	-725.4	18.281	11.629	-2.919	-2.009	1.740	-0.784	2379.0	13.846	1.000	270.0
600-45- 6	11220.7	2321.7	-505.7	18.599	12.038	-3.783	-2.009	1.740	-0.784	2414.5	13.715	1.000	270.0
600-45- 7	11478.3	2208.4	-748.3	18.096	10.820	-3.067	-2.009	1.740	-0.784	2342.6	13.650	1.000	270.0
600-46- 1	7766.8	1752.9	-745.6	19.543	13.635	-3.485	-0.124	0.537	-0.583	2059.9	10.659	1.000	285.0
600-46- 2	6448.5	1425.6	-620.3	19.700	13.800	-3.200	-0.124	0.537	-0.583	1891.4	9.766	1.000	285.0
600-46- 3	8710.2	1973.2	-818.5	20.100	13.400	-3.630	-0.124	0.537	-0.583	2185.2	11.353	1.000	285.0
600-46- 4	9775.9	2195.9	-505.2	20.300	13.200	-3.800	-0.124	0.537	-0.583	2318.5	12.155	1.000	285.0
600-46- 5	11915.1	2418.0	-326.5	20.190	11.404	-2.658	-0.124	0.537	-0.583	2456.4	13.310	1.000	285.0
600-46- 6	11578.5	2403.8	-795.9	20.265	11.837	-3.039	-0.124	0.537	-0.583	2441.3	13.137	1.000	285.0
600-46- 7	11793.1	2382.2	-671.5	20.069	11.224	-2.407	-0.124	0.537	-0.583	2431.1	13.133	1.000	285.0
600-46- 8	11321.2	2470.7	-1051.5	20.839	12.556	-4.209	-0.124	0.537	-0.583	2498.2	13.401	1.000	285.0
600-46- 9	11351.3	2268.5	-555.6	19.821	10.832	-1.876	-0.124	0.537	-0.583	2357.0	12.811	1.000	285.0
600-46-10	11912.4	2309.7	-717.2	19.905	10.729	-2.696	-0.124	0.537	-0.583	2395.9	13.092	1.000	285.0
600-46-11	11529.2	2221.2	-743.5	19.607	10.650	-2.875	-0.124	0.537	-0.583	2342.4	12.726	1.000	285.0
600-47- 1	8006.0	1826.1	-755.5	19.248	13.141	-3.922	-1.105	1.487	-0.063	2107.8	10.708	1.000	285.0
600-47- 2	9015.6	2051.8	-835.3	19.400	12.500	-4.100	-1.105	1.487	-0.063	2237.1	11.434	1.000	285.0
600-47- 3	9068.1	2114.5	-885.6	19.600	13.300	-4.300	-1.105	1.487	-0.063	2274.9	11.604	1.000	285.0
600-47- 4	10421.5	2366.7	-841.2	19.800	12.700	-3.750	-1.105	1.487	-0.063	2422.7	12.443	1.000	285.0
600-47- 5	8572.9	1682.6	-617.5	18.229	10.700	-3.199	-1.105	1.487	-0.063	2024.0	10.391	1.000	285.0
600-47- 6	12033.8	2023.5	-638.6	17.590	8.254	-3.089	-1.105	1.487	-0.063	2256.1	12.353	1.000	270.0
600-47- 7	11482.5	2221.8	-753.0	18.836	10.246	-3.453	-1.105	1.487	-0.063	2351.3	12.462	1.000	285.0
600-48- 1	8007.6	1839.5	-746.2	19.199	14.011	-2.378	-1.028	0.790	-1.304	2109.7	11.684	1.000	285.0
600-48- 2	7860.4	1835.8	-704.1	19.300	14.200	-2.700	-1.028	0.790	-1.304	2106.4	11.641	1.000	285.0
600-48- 3	8023.8	1911.9	-691.9	19.500	14.400	-2.500	-1.028	0.790	-1.304	2149.5	11.839	1.000	285.0
600-48- 4	10000.7	2267.6	-898.7	19.700	13.800	-3.300	-1.028	0.790	-1.304	2365.6	13.246	1.000	285.0
600-48- 5	11509.3	2420.5	-708.9	19.628	12.910	-2.199	-1.028	0.790	-1.304	2452.9	14.085	1.000	285.0
600-48- 6	11495.5	2189.1	-815.6	18.812	11.282	-2.900	-1.028	0.790	-1.304	2329.2	13.677	1.000	285.0
600-48- 7	11495.6	2220.6	-745.9	18.914	11.359	-2.925	-1.028	0.790	-1.304	2342.0	13.724	1.000	285.0

TABLE XVIII - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	C1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
600-A9- 1	11877.4	2242.1	-813.7	18.422	10.654	-2.371	-1.810	2.080	-1.659	2308.0	14.794	1.000	270.0
600-A9- 2	13359.1	2356.4	-805.6	19.500	10.300	-2.600	-1.810	2.080	-1.659	2428.8	16.038	1.000	270.0
600-A9- 3	10379.7	2050.4	-727.0	18.100	10.500	-2.003	-1.810	2.080	-1.659	2166.6	13.421	1.000	270.0
600-A9- 4	14578.1	2337.4	-533.8	19.230	10.000	-2.900	-1.830	2.080	-1.559	2512.7	17.343	1.000	270.0
600-A9- 5	11455.6	2172.7	-752.5	18.429	10.515	-2.019	-1.810	2.080	-1.659	2255.1	14.297	1.000	270.0
600-A9- 6	11610.4	2156.3	-730.8	18.366	10.432	-1.922	-1.830	2.080	-1.659	2243.7	14.234	1.000	270.0
600-A9- 7	11582.8	2159.9	-738.4	18.395	10.401	-1.956	-1.830	2.060	-1.659	2245.5	14.227	1.000	270.0
600-A9- 8	11609.8	2178.6	-767.0	18.460	10.573	-2.091	-1.830	2.080	-1.659	2259.8	14.321	1.000	270.0
600-A9- 9	11200.6	2146.2	-722.1	18.392	10.502	-1.918	-1.830	2.080	-1.659	2235.2	14.138	1.000	270.0
600-A9-10	11598.5	2278.2	-768.4	18.794	11.063	-2.028	-1.810	2.090	-1.659	2320.0	14.585	1.000	270.0
600-A9-11	11488.9	2202.7	-744.9	18.549	10.684	-1.958	-1.810	2.080	-1.659	2274.8	14.181	1.000	270.0
600-AA- 1	13078.5	2400.1	-847.4	18.784	11.827	-4.094	-0.818	-0.777	-0.653	2426.1	14.446	1.000	285.0
600-AA- 2	12378.8	2313.6	-775.8	18.534	11.743	-3.751	-0.818	-0.777	-0.653	2351.6	13.657	1.000	285.0
600-AA- 3	11716.7	2251.4	-834.7	18.451	12.077	-4.001	-0.818	-0.777	-0.653	2305.0	13.090	1.000	285.0
600-AA- 3	11716.7	2751.4	-834.7	18.451	12.077	-4.001	-0.818	-0.777	-0.653	2305.0	13.090	1.000	285.0
600-AA- 5	12162.6	2225.1	-874.1	18.264	11.577	-4.251	-0.818	-0.777	-0.653	2303.6	13.374	1.000	285.0
600-AA- 6	11655.2	2540.9	-660.8	19.450	13.577	-2.918	-0.818	-0.777	-0.653	2450.4	13.555	1.000	285.0
600-AA- 7	14334.6	3224.9	-421.2	21.820	15.634	-2.306	-0.818	-0.777	-0.653	2761.5	17.804	1.000	285.0
600-AA- 8	14693.7	3564.8	203.6	23.820	17.434	-0.306	-0.818	-0.777	-0.653	3234.3	20.006	1.000	285.0
600-AA- 9	15633.2	2239.2	618.8	25.820	15.634	-1.981	-0.818	-0.777	-0.653	3192.6	27.158	1.000	285.0
600-AA-10	15949.6	2065.3	1045.0	27.820	14.744	0.765	-0.818	-0.777	-0.653	3396.6	32.634	0.300	225.0
600-AA-11	15939.2	1627.1	1231.8	25.820	12.744	-1.225	-0.818	-0.777	-0.653	3019.6	30.596	0.350	225.0
600-AA-12	15735.9	1829.9	563.7	23.820	12.818	-2.065	-0.818	-0.777	-0.653	2851.3	25.540	1.000	285.0
600-AA-13	15558.1	2185.7	14.1	21.820	12.620	-2.686	-0.818	-0.777	-0.653	2712.3	21.453	1.000	85.0
600-AA-14	15405.1	2385.5	-567.0	19.948	11.831	-3.755	-0.818	-0.777	-0.653	2615.7	18.443	1.000	285.0
600-AA-15	13127.5	2331.9	-865.4	18.569	11.464	-4.215	-0.818	-0.777	-0.653	2391.0	14.356	1.000	285.0
600-AB- 1	13018.4	2373.8	-870.3	18.264	11.365	-3.272	-2.247	1.291	-1.410	2434.0	15.582	1.000	270.0
600-AB- 2	12359.8	2304.0	-795.6	18.014	11.282	-2.938	-2.247	1.291	-1.410	2361.6	14.980	1.000	270.0
600-AB- 3	11641.5	2251.2	-848.3	17.931	11.615	-3.148	-2.247	1.291	-1.410	2315.7	14.319	1.000	270.0
600-AB- 4	12125.3	2217.3	-892.3	17.764	11.115	-3.438	-2.247	1.291	-1.410	2312.6	14.555	1.000	270.0
600-AB- 5	11434.1	2183.8	-743.7	17.707	11.248	-2.697	-2.247	1.291	-1.410	2264.2	14.012	1.000	270.0
600-AB- 6	11497.6	2209.7	-746.8	17.792	11.364	-2.696	-2.247	1.291	-1.410	2280.1	14.094	1.000	270.0
600-AC- 1	13327.6	2461.5	-838.3	19.649	11.434	-3.084	-0.391	-0.111	-1.143	2437.2	15.197	1.000	285.0
600-AC- 2	12611.2	2378.0	-783.9	19.349	11.351	-2.751	-0.391	-0.111	-1.143	2357.8	14.412	1.000	285.0
600-AC- 3	11919.2	2312.6	-819.8	19.316	11.684	-3.001	-0.391	-0.111	-1.143	2311.2	13.795	1.000	285.0
600-AC- 4	12367.6	2248.0	-860.5	19.149	11.184	-3.251	-0.391	-0.111	-1.143	2310.7	14.087	1.000	285.0
600-AC- 5	11493.2	2195.0	-747.6	18.537	11.202	-2.606	-0.391	-0.111	-1.143	2224.6	13.214	1.000	285.0
600-AC- 6	11496.9	2207.4	-745.7	19.023	11.349	-2.605	-0.391	-0.111	-1.143	2237.4	13.261	1.000	285.0
600-AD- 1	12527.6	2459.0	-756.9	18.937	11.327	-3.008	-1.342	0.902	-0.667	2409.1	14.239	1.000	285.0
600-AD- 2	11760.8	2345.9	-671.9	18.687	11.243	-2.674	-1.342	0.902	-0.667	2318.4	13.485	1.000	285.0
600-AD- 3	11044.3	2261.6	-715.9	18.604	11.577	-2.924	-1.342	0.902	-0.667	2263.1	12.932	1.000	285.0
600-AD- 4	11512.8	2251.4	-760.3	18.437	11.077	-3.174	-1.342	0.902	-0.667	2248.8	13.175	1.000	285.0
600-AD- 5	11505.3	2204.7	-746.4	18.265	10.766	-3.113	-1.342	0.902	-0.667	2240.8	13.084	1.000	285.0

TABLE XVIII - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A1S	B1S	P1S	SERVO FLAP CONTROLS D0S	C1S	D1C	HP	ALFA PAR ALFA	RAD	RPM
600-AE- 1	13466.0	2321.0	-554.3	18.974	11.472	-3.348	-1.296	0.279	-1.896	2449.5	16.744	1.000	285.0
600-AE- 2	13223.4	2234.6	-885.1	18.726	11.389	-3.015	-1.296	0.279	-1.936	2348.6	15.944	1.000	285.0
600-AE- 3	12569.6	2274.8	-547.9	18.643	11.722	-3.265	-1.276	0.279	-1.846	2354.1	15.258	1.000	285.0
600-AE- 4	13014.8	2219.7	-946.6	18.476	11.222	-3.515	-1.296	0.279	-1.496	2344.5	15.599	1.000	285.0
600-AE- 5	11413.5	2072.3	-731.2	18.028	11.156	-2.277	-1.296	0.279	-1.896	2190.4	13.850	1.000	285.0
600-AE- 6	11412.7	2194.1	-745.2	18.443	11.875	-2.288	-1.296	0.279	-1.836	2259.7	14.143	1.000	285.0
600-AE- 7	11495.8	2209.4	-746.1	18.501	11.513	-2.252	-1.296	0.279	-1.936	2268.0	14.173	1.000	285.0
600-AF- 1	14106.6	2548.1	-801.2	19.457	11.650	-3.011	-1.319	0.590	-1.276	2552.7	16.435	1.000	285.0
600-AF- 2	12810.5	2442.7	-873.6	18.557	11.983	-2.345	-1.319	0.590	-1.276	2414.3	14.993	1.000	285.0
600-AF- 3	11632.4	2318.1	-760.2	18.790	12.150	-2.845	-1.319	0.590	-1.276	2317.6	13.758	1.000	285.0
600-AF- 4	12350.6	2265.1	-875.5	18.457	11.150	-3.345	-1.319	0.590	-1.276	2318.7	14.325	1.000	285.0
600-AF- 5	11372.9	2125.0	-724.8	18.089	10.576	-2.865	-1.319	0.590	-1.276	2202.9	13.342	1.000	285.0
600-AF- 6	11536.7	2212.3	-748.5	19.377	11.360	-2.711	-1.319	0.590	-1.276	2255.7	13.591	1.000	285.0
600-AG- 1	12641.1	2444.3	-810.3	18.551	12.327	-3.834	-0.818	-0.777	-0.653	2433.7	14.167	1.000	285.0
600-AG- 2	11962.4	2346.4	-743.3	18.701	12.244	-3.501	-0.818	-0.777	-0.653	2354.7	13.400	1.000	285.0
600-AG- 3	11236.3	2265.0	-785.5	18.018	12.577	-3.751	-0.818	-0.777	-0.653	2299.9	12.784	1.000	285.0
600-AG- 4	11715.9	2250.8	-834.7	18.451	12.077	-4.001	-0.818	-0.777	-0.653	2304.6	13.087	1.000	285.0
600-AG- 5	11451.5	2192.7	-737.3	18.276	11.815	-3.567	-0.818	-0.777	-0.653	2259.5	12.758	1.000	285.0
600-AG- 6	11503.5	2210.1	-748.2	19.330	11.888	-3.592	-0.818	-0.777	-0.653	2271.2	12.829	1.000	285.0
600-AH- 1	11027.5	2408.9	-834.2	20.289	11.407	-2.335	0.561	-0.491	0.024	2331.7	12.237	1.000	285.0
600-AH- 2	10744.6	2237.6	-559.0	20.039	11.324	-2.502	0.561	-0.491	0.024	2225.0	11.448	1.000	285.0
600-AH- 3	10036.8	2120.7	-598.5	19.556	11.657	-2.752	0.561	-0.491	0.024	2157.0	11.115	1.000	285.0
600-AH- 4	10501.6	2135.5	-838.3	19.789	11.157	-3.002	0.561	-0.491	0.024	2171.8	11.201	1.000	285.0
600-AH- 5	11539.2	2178.9	-745.7	19.806	10.936	-3.601	0.561	-0.491	0.024	2224.2	11.841	1.000	285.0
600-AH- 6	11491.3	2209.1	-746.3	19.648	10.513	-3.574	0.561	-0.491	0.024	2228.9	11.849	1.000	285.0
600-AI- 1	10712.2	2208.5	-562.9	21.534	11.855	-3.456	2.845	-3.126	0.651	2217.6	10.896	1.000	300.0
600-AI- 2	9805.1	2018.1	-447.4	21.284	11.772	-3.122	2.845	-3.126	0.651	2107.2	10.204	1.000	300.0
600-AI- 3	8959.5	1854.8	-531.3	21.200	12.105	-3.372	2.845	-3.126	0.651	2017.5	9.723	1.000	300.0
600-AI- 4	9501.8	1908.4	-587.3	21.034	11.605	-3.622	2.845	-3.126	0.651	2051.3	5.984	1.000	300.0
600-AI- 5	11361.2	2125.4	-755.9	20.541	10.804	-4.707	2.845	-3.126	0.651	2196.3	11.049	1.000	300.0
600-AI- 6	11472.2	2194.8	-751.3	21.196	11.115	-4.614	2.845	-3.126	0.651	2233.6	11.230	1.000	300.0
600-AI- 7	11493.2	2206.4	-748.2	21.232	11.160	-4.576	2.845	-3.126	0.651	2235.6	11.253	1.000	300.0
600-AJ- 1	12538.6	2418.8	-740.4	21.726	11.539	-2.904	2.392	-2.215	-0.744	2367.9	13.172	1.000	300.0
600-AJ- 2	11780.8	2293.6	-665.9	21.476	11.455	-2.470	2.392	-2.215	-0.744	2280.8	12.415	1.000	300.0
600-AJ- 3	11073.8	2147.9	-717.1	21.392	11.789	-2.720	2.392	-2.215	-0.744	2220.6	11.917	1.000	300.0
600-AJ- 4	11504.2	2191.4	-755.2	21.228	11.289	-2.970	2.392	-2.215	-0.744	2227.4	12.145	1.000	300.0
600-AJ- 5	11512.2	2211.8	-748.0	21.296	11.404	-2.906	2.392	-2.215	-0.744	2239.3	12.184	1.000	300.0
600-AK- 1	10331.7	2261.7	-515.9	18.898	11.102	-2.670	-1.388	1.520	0.942	2259.7	11.691	1.000	270.0
600-AK- 2	9473.5	2058.7	-453.2	18.648	11.099	-2.336	-1.388	1.520	0.942	2143.2	11.014	1.000	270.0
600-AK- 3	8668.0	1898.9	-484.1	18.565	11.432	-2.586	-1.388	1.520	0.942	2054.4	10.507	1.000	270.0
600-AK- 4	9188.0	1947.8	-513.9	18.358	10.932	-2.836	-1.388	1.520	0.942	2080.5	10.726	1.000	270.0
600-AK- 5	11532.8	2074.1	-802.8	17.797	9.024	-4.409	-1.388	1.520	0.942	2185.4	11.850	1.000	270.0
600-AK- 6	11468.0	2194.6	-751.1	18.228	9.717	-4.034	-1.388	1.520	0.942	2247.2	12.024	1.000	270.0
600-AK- 7	11494.4	2204.9	-747.1	18.261	9.769	-4.005	-1.388	1.520	0.942	2252.7	12.042	1.000	270.0

TABLE XVIII - Continued

CASE NO	FZ	FX	FY	PITCH PERF CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	C1S	C1C	HP	ALFA MAX ALFA	RAD	RPM
600-AL- 1	12571.2	2440.4	-671.0	18.808	10.726	-2.939	-1.378	1.144	-0.432	2364.1	13.547	1.000	285.0
600-AL- 2	11790.6	2319.4	-601.2	18.558	10.641	-2.532	-1.378	1.144	-0.432	2296.5	13.217	1.000	285.0
600-AL- 3	11077.1	2215.3	-647.3	18.475	10.576	-2.752	-1.378	1.144	-0.432	2219.2	12.693	1.000	285.0
600-AL- 4	11544.1	2221.7	-685.1	18.300	10.474	-3.002	-1.378	1.144	-0.432	2245.5	12.445	1.000	235.0
600-AL- 5	11536.4	2214.4	-747.8	18.281	10.537	-3.305	-1.378	1.144	-0.432	2241.4	12.516	1.000	285.0
600-AM- 1	12563.1	2460.6	-668.7	19.822	10.530	-2.736	-0.144	0.428	-0.219	2392.5	13.282	1.000	235.0
600-AM- 2	11744.6	2324.5	-597.6	19.572	10.446	-2.403	-0.144	0.428	-0.219	2299.6	12.518	1.000	245.0
600-AM- 3	11019.4	2228.1	-644.5	19.489	10.780	-2.651	-0.144	0.428	-0.219	2236.5	12.002	1.000	235.0
600-AM- 4	11482.0	2224.6	-684.4	19.322	10.280	-2.903	-0.144	0.428	-0.219	2243.8	12.250	1.000	295.0
600-AM- 5	11518.6	2216.5	-741.2	19.286	10.258	-3.239	-0.144	0.428	-0.219	2243.4	12.245	1.000	235.0
600-AN- 1	12248.5	2414.9	-654.6	20.508	10.454	-2.599	0.687	-0.112	-0.179	2371.9	12.604	1.000	285.0
600-AN- 2	11341.2	2253.1	-578.9	20.258	10.410	-2.246	0.687	-0.112	-0.179	2265.8	11.823	1.000	245.0
600-AN- 3	10635.9	2145.7	-621.7	20.174	10.744	-2.516	0.687	-0.112	-0.179	2201.1	11.336	1.000	265.0
600-AN- 4	11108.5	2157.1	-663.6	20.008	10.244	-2.766	0.687	-0.112	-0.179	2214.2	11.595	1.000	245.0
600-AN- 5	11459.0	2210.0	-751.4	20.064	10.279	-3.102	0.687	-0.112	-0.179	2250.7	11.902	1.000	285.0
600-AO- 1	11746.9	2331.0	-624.2	21.191	10.457	-2.462	1.518	-0.653	-0.140	2329.0	11.794	1.000	285.0
600-AO- 2	10848.9	2163.4	-547.1	20.943	10.374	-2.127	1.518	-0.653	-0.140	2226.2	11.063	1.000	245.0
600-AO- 3	10161.1	2039.9	-588.9	20.860	10.761	-2.379	1.518	-0.653	-0.140	2155.8	10.739	1.000	285.0
600-AO- 4	10624.8	2059.9	-627.3	20.693	10.207	-2.629	1.518	-0.653	-0.140	2172.0	10.844	1.000	295.0
600-AO- 5	11583.6	2223.6	-758.7	20.873	10.218	-3.203	1.518	-0.653	-0.140	2277.4	11.609	1.000	285.0
600-AO- 6	11450.9	2203.0	-743.7	20.861	10.220	-3.149	1.518	-0.653	-0.140	2260.9	11.513	1.000	295.0
600-AP- 1	11793.9	2337.7	-657.1	20.448	9.935	-3.027	0.636	0.271	0.319	2339.4	11.661	1.000	295.0
600-AP- 2	10924.9	2160.5	-578.4	20.198	9.852	-2.694	0.636	0.271	0.319	2243.2	10.927	1.000	285.0
600-AP- 3	10227.8	2048.8	-617.9	20.114	10.185	-2.944	0.636	0.271	0.319	2167.5	10.629	1.000	285.0
600-AP- 4	10691.7	2065.1	-655.1	19.948	9.685	-3.194	0.636	0.271	0.319	2182.2	10.719	1.000	285.0
600-AP- 5	11537.1	2210.3	-755.4	20.104	9.650	-3.546	0.636	0.271	0.319	2276.2	11.372	1.000	285.0
600-AQ- 1	12541.4	2462.0	-641.2	20.568	11.053	-2.171	0.739	-0.496	-0.678	2385.5	13.521	1.000	285.0
600-AQ- 2	11731.2	2325.2	-572.3	20.318	10.570	-1.838	0.739	-0.496	-0.678	2291.3	12.728	1.000	285.0
600-AQ- 3	11011.4	2227.8	-618.1	20.235	11.303	-2.098	0.739	-0.496	-0.678	2230.7	12.210	1.000	285.0
600-AQ- 4	11471.4	2224.5	-658.4	20.068	10.803	-2.338	0.739	-0.496	-0.678	2236.7	12.474	1.000	285.0
600-AQ- 5	11523.4	2218.9	-751.4	20.040	10.868	-2.810	0.739	-0.496	-0.678	2239.5	12.545	1.000	285.0
600-AR- 1	12749.2	2421.9	-748.3	21.434	12.702	-1.651	1.722	-2.181	-2.178	2398.4	15.234	1.000	285.0
600-BA- 1	11946.2	2307.9	-714.3	17.368	10.101	-3.796	-3.050	2.610	0.277	2346.6	13.879	1.000	270.0
600-BA- 2	11218.5	2191.4	-637.1	17.118	10.018	-3.461	-3.050	2.610	0.277	2272.6	13.246	1.000	270.0
600-BA- 3	10546.7	2116.3	-678.1	17.035	10.351	-3.711	-3.050	2.610	0.277	2203.2	12.779	1.000	270.0
600-BA- 4	11029.6	2108.1	-721.2	16.868	9.851	-3.961	-3.050	2.610	0.277	2215.3	13.003	1.000	270.0
600-BA- 5	11447.4	2211.8	-750.0	17.135	10.053	-4.023	-3.050	2.610	0.277	2284.9	13.446	1.000	270.0
600-BB- 1	11845.1	2303.4	-709.4	17.417	10.650	-3.355	-3.036	2.312	-0.321	2353.0	14.230	1.000	270.0
600-BB- 2	11174.2	2193.0	-635.1	17.167	10.566	-3.021	-3.036	2.312	-0.321	2265.5	13.613	1.000	270.0
600-BB- 3	10493.0	2119.7	-676.8	17.084	10.900	-3.271	-3.036	2.312	-0.321	2211.3	13.100	1.000	270.0
600-BB- 4	10937.2	2101.0	-718.2	16.917	10.400	-3.521	-3.036	2.312	-0.321	2216.8	13.319	1.000	270.0
600-BB- 5	11508.6	2214.9	-745.4	17.198	10.551	-3.696	-3.036	2.312	-0.321	2291.6	13.947	1.000	270.0
600-BC- 1	11767.2	2292.5	-706.0	17.467	11.158	-2.915	-3.023	2.015	-0.918	2348.3	14.496	1.000	270.0
600-BC- 2	11033.6	2181.7	-632.3	17.217	11.115	-2.581	-3.023	2.015	-0.918	2261.8	13.979	1.000	270.0
600-BC- 3	10327.4	2096.0	-673.3	17.133	11.448	-2.831	-3.023	2.015	-0.918	2207.7	13.358	1.000	270.0
600-BC- 4	10797.3	2071.7	-714.4	16.967	10.948	-3.041	-3.023	2.015	-0.918	2214.6	13.595	1.000	270.0
600-BC- 5	11479.4	2209.1	-750.0	17.232	11.010	-3.194	-3.023	2.015	-0.918	2299.0	14.208	1.000	270.0
600-AT- 1	12749.2	2421.9	-748.3	21.436	12.702	-1.651	1.722	-2.181	-2.178	2398.4	15.234	1.000	235.0
600-AT- 2	12024.2	2329.4	-672.5	21.184	12.616	-1.318	1.722	-2.181	-2.178	2320.3	14.438	1.000	245.0
600-AT- 3	11311.1	2249.9	-716.9	21.101	12.952	-1.568	1.722	-2.181	-2.178	2266.8	13.743	1.000	245.0
600-AT- 4	11751.0	2232.3	-758.5	20.934	12.452	-1.818	1.722	-2.181	-2.178	2269.5	14.066	1.000	285.0
600-AT- 5	11516.1	2212.3	-746.6	20.902	12.532	-1.761	1.722	-2.181	-2.178	2252.0	13.835	1.000	285.0

TABLE XIX. LIST OF COMPUTER RUNS FOR THE CTR-E CONFIGURATION. V = 160 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	A0S	B1S	A1S	D0S	D1S	D1C	HP	ALFA	RAD	R/M
700-A1- 1	7670.0	1500.4	-715.1	19.569	11.384	-1.625	-1.810	2.080	-1.659	1766.4	15.846	1.000	300.0
700-A1- 2	6671.0	1320.5	-597.6	19.069	11.017	-0.958	-1.810	2.080	-1.659	1621.8	14.557	1.000	285.0
700-A1- 3	5942.4	1200.4	-607.8	18.867	11.684	-1.458	-1.810	2.080	-1.659	1557.4	14.136	1.000	285.0
700-A1- 4	6505.7	1240.0	-687.1	18.569	10.824	-1.958	-1.810	2.080	-1.659	1573.2	14.228	1.000	285.0
700-A1- 5	11015.3	1942.7	-378.6	20.813	8.608	0.339	-1.810	2.080	-1.659	1975.5	19.280	1.000	300.0
700-A1- 6	10934.4	1998.9	-631.2	21.400	10.615	-0.927	-1.810	2.080	-1.659	2077.4	20.253	1.000	300.0
700-A1- 7	11652.9	2313.9	-728.6	23.043	12.716	-1.413	-1.810	2.080	-1.659	2313.6	22.979	1.000	300.0
700-A1- 8	11516.4	2708.2	-743.7	22.483	12.106	-1.490	-1.810	2.080	-1.659	2233.7	22.033	1.000	300.0
700-A2- 1	7978.5	1592.3	-726.6	19.377	11.866	-2.378	-1.319	0.590	-1.276	1767.4	16.225	1.000	300.0
700-A2- 2	6817.7	1364.5	-600.5	18.877	11.653	-1.711	-1.319	0.590	-1.276	1629.6	14.663	1.000	285.0
700-A2- 3	6138.9	1274.7	-628.9	18.710	12.360	-2.211	-1.319	0.590	-1.276	1585.8	14.362	1.000	285.0
700-A2- 4	6761.8	1285.6	-674.1	18.377	11.360	-2.711	-1.319	0.590	-1.276	1587.0	14.516	1.000	285.0
700-A2- 5	11308.9	1927.4	-434.7	20.824	10.066	-0.982	-1.319	0.590	-1.276	2013.5	20.458	1.000	300.0
700-A2- 6	10942.5	2023.6	-641.0	21.378	11.710	-1.930	-1.319	0.590	-1.276	2077.2	20.993	1.000	300.0
700-A2- 7	11607.0	2225.9	-697.0	22.654	13.254	-2.339	-1.319	0.590	-1.276	2236.5	23.216	1.000	300.0
700-A2- 8	11519.6	2194.5	-732.7	22.444	13.111	-2.475	-1.319	0.590	-1.276	2212.8	22.853	1.000	300.0
700-A2- 9	11520.6	2215.7	-747.4	22.537	13.302	-2.541	-1.319	0.590	-1.276	2227.1	22.987	1.000	300.0
700-A3- 1	8789.4	1677.4	-826.5	19.284	12.077	-3.917	-0.818	-0.777	-0.653	1927.6	16.850	1.000	300.0
700-A3- 2	8156.2	1574.3	-757.0	19.034	11.594	-3.584	-0.818	-0.777	-0.653	1780.0	15.931	1.000	300.0
700-A3- 3	7819.9	1519.7	-781.0	18.551	12.327	-3.834	-0.818	-0.777	-0.653	1737.5	15.707	1.000	300.0
700-A3- 4	8142.6	1533.1	-810.0	18.704	11.827	-4.084	-0.818	-0.777	-0.653	1738.7	15.777	1.000	300.0
700-A3- 5	10729.1	2526.9	-512.2	21.150	11.573	-2.160	-0.818	-0.777	-0.653	2058.2	20.725	1.000	300.0
700-A3- 6	10927.1	2061.4	-625.9	21.407	12.833	-2.403	-0.818	-0.777	-0.653	2094.4	21.215	1.000	300.0
700-A3- 7	11231.7	2175.0	-710.7	22.462	13.574	-3.448	-0.818	-0.777	-0.653	2197.0	22.945	1.000	300.0
700-A3- 8	11377.2	2188.9	-715.5	22.449	13.925	-3.540	-0.818	-0.777	-0.653	2207.4	23.092	1.000	300.0
700-A3- 9	11308.8	2177.7	-734.4	22.538	14.062	-3.706	-0.818	-0.777	-0.653	2207.5	23.236	1.000	300.0
700-A3-10	11360.6	2188.1	-745.8	22.651	14.143	-3.767	-0.818	-0.777	-0.653	2215.2	23.336	1.000	300.0
700-A3-11	11459.3	2201.8	-730.4	22.676	14.120	-3.675	-0.818	-0.777	-0.653	2224.6	23.450	1.000	300.0
700-A3-12	11341.3	2179.4	-706.8	22.408	13.864	-3.495	-0.818	-0.777	-0.653	2201.7	23.067	1.000	300.0
700-A3-13	11507.1	2214.8	-735.2	22.811	14.262	-3.792	-0.818	-0.777	-0.653	2239.2	23.738	1.000	300.0
700-A3-14	11571.1	2201.2	-742.9	22.875	14.322	-3.950	-0.818	-0.777	-0.653	2249.2	24.186	1.000	300.0
700-A4- 1	8135.1	1505.5	-807.1	18.264	11.365	-3.272	-2.247	1.291	-1.410	1727.8	16.339	1.000	300.0
700-A4- 2	7674.1	1435.4	-743.5	18.014	11.282	-2.938	-2.247	1.291	-1.410	1677.2	15.652	1.000	285.0
700-A4- 3	7242.7	1372.7	-755.5	17.931	11.615	-3.148	-2.247	1.291	-1.410	1643.1	15.376	1.000	300.0
700-A4- 4	7610.9	1381.8	-788.2	17.764	11.115	-3.438	-2.247	1.291	-1.410	1649.5	15.551	1.000	285.0
700-A4- 5	11035.5	2003.3	-477.6	20.525	11.151	-0.991	-2.247	1.291	-1.410	2057.2	20.745	1.000	300.0
700-A4- 6	11141.1	2078.4	-585.4	21.214	12.226	-1.706	-2.247	1.291	-1.410	2130.6	21.976	1.000	300.0
700-A4- 7	11666.9	2273.5	-756.2	22.407	13.587	-2.716	-2.247	1.291	-1.410	2285.4	23.573	1.000	300.0
700-A4- 8	11553.2	2235.2	-752.3	22.230	13.375	-2.683	-2.247	1.291	-1.410	2259.4	23.702	1.000	300.0
700-A4- 9	11677.6	2262.0	-762.6	22.276	13.835	-2.696	-2.247	1.291	-1.410	2274.4	23.818	1.000	300.0
700-A4-10	11623.4	2233.5	-751.2	22.099	13.614	-2.645	-2.247	1.291	-1.410	2254.7	23.609	1.000	300.0
700-A4-11	11543.9	2216.9	-751.0	22.102	13.621	-2.654	-2.247	1.291	-1.410	2244.4	23.513	1.000	300.0
700-A5- 1	7890.5	1513.0	-756.5	19.659	11.434	-3.084	-0.391	-0.111	-1.143	1725.4	15.834	1.000	300.0
700-A5- 2	7367.6	1423.0	-725.3	19.399	11.751	-2.751	-0.391	-0.111	-1.143	1665.6	14.883	1.000	300.0
700-A5- 3	6993.0	1359.7	-741.5	19.316	11.684	-3.001	-0.391	-0.111	-1.143	1636.3	14.554	1.000	285.0
700-A5- 4	7371.0	1385.4	-774.3	19.149	11.184	-3.251	-0.391	-0.111	-1.143	1647.1	14.819	1.000	300.0
700-A5- 5	11240.2	2009.4	-418.7	21.750	10.358	-0.728	-0.391	-0.111	-1.143	2052.3	20.508	1.000	300.0
700-A5- 6	11269.1	2090.4	-614.8	22.368	11.773	-1.760	-0.391	-0.111	-1.143	2120.9	21.407	1.000	300.0
700-A5- 7	11556.5	2224.1	-732.5	23.231	13.129	-2.408	-0.391	-0.111	-1.143	2227.7	22.754	1.000	300.0
700-A5- 8	11443.7	2209.5	-738.3	23.144	13.062	-2.462	-0.391	-0.111	-1.143	2215.2	22.650	1.000	300.0

TABLE XIX - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	A1S	B1S	SERVO FLAP CONTROLS C0S	C1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
700-A6- 1	7310.6	1552.5	-725.8	18.577	11.321	-3.098	-1.362	0.902	-0.667	1643.5	14.961	1.000	255.0
700-A6- 2	8603.6	1304.7	-635.3	18.687	11.243	-2.674	-1.362	0.902	-0.667	1598.7	14.25[illegible]	1.000	285.0
700-A6- 3	8213.6	1235.3	-645.9	18.624	11.577	-2.724	-1.362	0.902	-0.667	1566.0	14.01[illegible]	1.000	285.0
700-A6- 4	6571.7	1264.3	-678.3	18.437	11.077	-3.174	-1.362	0.902	-0.667	1577.2	14.076	1.000	285.0
700-A6- 5	10761.9	1836.2	-393.6	20.073	8.801	-0.950	-1.362	0.902	-0.667	1942.6	18.417	1.000	300.0
700-A6- 6	10795.2	1979.3	-603.6	20.369	10.573	-1.914	-1.362	0.902	-0.667	2041.6	19.261	1.000	300.0
700-A6- 7	11121.8	2073.5	-678.0	21.482	11.353	-2.487	-1.362	0.902	-0.667	2111.9	20.519	1.000	300.0
700-A6- 8	11535.6	2151.2	-721.3	22.040	12.040	-2.717	-1.362	0.902	-0.667	2191.4	21.558	1.000	300.0
700-A6- 9	11646.0	2200.0	-745.2	22.150	12.307	-2.802	-1.362	0.902	-0.657	2207.9	21.606	1.000	300.0
700-A7- 1	9329.0	1667.6	-830.1	19.476	11.722	-3.181	-1.296	0.279	1.886	1847.6	18.466	1.000	300.0
700-A7- 2	8386.9	1547.1	-774.1	18.516	11.556	-2.515	-1.296	0.279	-1.896	1741.1	16.753	1.000	300.0
700-A7- 3	7623.8	1458.6	-808.8	18.810	12.222	-3.015	-1.296	0.279	-1.[illegible]95	1693.4	16.073	1.000	300.0
700-A7- 4	8362.6	1460.9	-881.1	18.478	11.222	-3.515	-1.296	0.279	-1.895	1706.1	17.566	1.000	300.0
700-A7- 5	8922.5	1845.6	-630.8	20.476	12.028	-0.979	-1.296	0.279	-1.846	1916.9	18.336	1.000	300.0
700-A7- 6	11324.3	2140.1	-528.5	22.269	12.586	-0.902	-1.296	0.275	-1.866	2164.1	22.962	1.000	300.0
700-A7- 7	11252.6	2126.9	-668.2	22.270	13.379	-1.729	-1.296	0.279	-1.846	2168.6	23.144	1.000	300.0
700-A7- 8	11445.8	2210.8	-723.1	22.853	14.144	-2.117	-1.296	0.279	-1.886	2236.9	24.050	1.000	300.0
700-A7- 9	11478.8	2203.7	-748.0	22.861	14.160	-2.266	-1.296	0.279	-1.846	2236.2	24.103	1.000	300.0
700-A8- 1	11796.7	2271.2	-674.2	23.311	14.512	-3.625	-0.818	-0.777	-0.653	2287.0	24.489	1.000	300.0
700-A8- 2	11490.5	2263.8	-651.6	23.061	14.429	-3.292	-0.818	-0.777	-0.653	2260.0	23.785	1.000	300.0
700-A8- 3	11235.7	2268.2	-731.3	22.578	14.762	-3.542	-0.818	-0.777	-0.653	2257.6	23.447	1.000	300.0
700-A8- 4	11479.8	2208.9	-718.0	22.811	14.282	-3.792	-0.818	-0.777	-0.653	2235.0	23.662	1.000	300.0
700-A9- 1	5245.7	1064.4	-512.6	18.898	11.182	-2.670	-1.388	1.520	0.542	1488.6	12.611	1.000	285.0
700-A9- 2	6583.6	877.0	-432.7	18.648	11.059	-2.336	-1.388	1.520	0.542	1401.2	11.954	1.000	285.0
700-A9- 3	6229.4	875.6	-430.4	18.565	11.432	-2.586	-1.388	1.520	0.542	1365.4	11.796	1.000	285.0
700-A9- 4	4465.8	842.4	-450.5	18.398	10.532	-2.836	-1.388	1.520	0.542	1373.6	11.819	1.000	285.0
700-A9- 5	7957.6	1548.3	-445.7	19.350	8.532	-1.401	-1.388	1.520	0.542	1748.0	13.908	1.000	285.0
700-A9- 6	11333.6	1734.6	-698.1	19.498	7.093	-3.695	-1.388	1.520	0.542	1926.0	17.135	1.000	300.0
700-A9- 7	11217.2	1921.1	-555.4	20.246	8.181	-2.798	-1.388	1.520	0.542	2018.1	17.613	1.000	300.0
700-A9- 8	13046.7	2064.8	-545.0	22.246	10.181	-5.631	-1.388	1.520	0.542	2212.5	22.733	1.000	300.0
700-A9- 9	12151.5	2499.0	-805.7	23.286	12.604	-3.747	-1.388	1.520	0.542	2404.7	21.790	1.000	300.0
700-A9-10	11422.6	2168.2	-747.6	21.567	10.385	-3.433	-1.388	1.520	0.542	2174.9	19.240	1.000	300.0
700-A9-11	11551.9	2222.0	-745.3	21.760	10.627	-3.410	-1.388	1.520	0.542	2207.5	19.542	1.000	300.0
700-A9-12	11463.9	2195.2	-740.2	21.555	10.413	-3.324	-1.388	1.520	0.542	2184.8	19.236	1.000	300.0
700-A9-13	11471.0	2206.9	-745.6	21.468	10.550	-3.310	-1.388	1.520	0.542	2195.5	19.377	1.000	300.0

TABLE XIX - Continued

CASE NO	FZ	FX	FY	PITCH [illegible] CONTROLS AOS	BIS	AIS	STAND [illegible] CONTROLS DOS	CIS	EIC	HP	ALFA	ALFA MAX RAD	AZM
700-AA- 1	[illegible]	[illegible]	-751.0	22.818	11.573	-2.710	3.319	-2.916	-0.610	1657.8	13.261	1.000	295.0
700-AA- 2	6344.7	1373.2	-651.6	22.168	11.450	-2.377	3.319	-2.916	-0.610	1614.3	13.433	1.000	295.0
700-AA- 3	5971.9	1219.4	-645.3	22.065	11.823	-2.627	3.319	-2.916	-0.610	1571.0	12.231	1.000	295.0
700-AA- 4	6208.7	1237.2	-673.5	21.518	11.723	-2.877	3.319	-2.916	-0.610	1573.9	12.299	1.000	295.0
700-AA- 5	8024.8	1562.4	-614.5	22.528	9.323	-0.316	3.319	-2.916	-0.610	1761.3	13.912	1.000	300.0
700-AA- 6	11120.4	1804.5	-525.6	23.237	8.138	-1.417	3.319	-2.916	-0.610	1912.0	14.698	1.000	300.0
700-AA- 7	10969.2	1890.5	-538.0	23.685	8.553	-1.249	3.319	-2.916	-0.610	1970.0	19.032	1.000	300.0
700-AA- 8	11407.6	1962.5	-543.8	24.155	9.243	-1.132	3.319	-2.916	-0.610	2033.1	20.057	1.000	300.0
700-AA- 9	11023.8	1947.3	-456.8	23.535	9.160	-0.759	3.319	-2.916	-0.610	2005.4	19.143	1.000	300.0
700-AA-10	10696.7	1932.5	-533.8	23.852	9.491	-1.049	3.319	-2.916	-0.610	1991.1	18.769	1.000	300.0
700-AA-11	10963.7	1989.9	-538.1	23.695	9.553	-1.294	3.319	-2.916	-0.610	1977.2	19.014	1.000	300.0
700-AA-12	12771.4	2074.3	-585.8	26.201	10.553	-2.638	3.319	-2.916	-0.610	2221.0	24.779	1.000	300.0
700-AA-13	14399.5	2238.8	-612.4	29.070	12.593	-3.116	3.319	-2.916	-0.610	2551.8	31.066	1.000	300.0
700-AA-14	14064.4	2427.7	-650.6	29.597	14.553	-4.058	3.319	-2.916	-0.610	2683.0	31.670	1.000	315.0
700-AA-15	12308.6	2425.4	-801.1	27.512	14.723	-3.174	3.319	-2.916	-0.610	2421.6	25.461	1.000	300.0
700-AA-16	11821.7	2276.0	-771.6	25.250	12.457	-2.610	3.319	-2.916	-0.610	2273.3	23.123	1.000	300.0
700-AA-17	11503.2	2213.5	-742.1	25.572	11.563	-2.244	3.319	-2.916	-0.610	2203.3	21.714	1.000	300.0
700-AB- 1	12629.6	1995.8	-1254.5	21.166	12.451	-5.696	-4.453	4.141	-1.668	2261.4	25.545	1.000	300.0
700-AB- 2	12525.0	2032.0	-1238.7	20.916	12.369	-5.271	-4.453	4.141	-1.668	2264.7	25.056	1.000	300.0
700-AB- 3	12196.4	2029.7	-1255.6	20.812	12.501	-5.571	-4.453	4.141	-1.658	2254.1	24.653	1.000	300.0
700-AB- 4	12501.8	1973.4	-1321.2	20.666	12.401	-5.773	-4.453	4.141	-1.658	2235.7	24.971	1.000	300.0
700-AB- 5	13247.7	2127.8	-1512.0	22.666	14.401	-6.712	-4.453	4.141	-1.658	2443.5	28.191	1.000	300.0
700-AB- 6	12101.6	2027.0	-1154.8	20.665	12.401	-4.712	-4.453	4.141	-1.668	2236.6	24.282	1.000	300.0
700-AB- 7	10527.4	1850.2	-872.5	19.550	10.556	-2.712	-4.453	4.141	-1.658	2023.6	20.349	1.000	300.0
700-AB- 8	11572.7	2210.1	-775.7	20.805	12.509	-2.098	-4.453	4.141	-1.658	2271.3	22.501	1.000	300.0
700-AB- 9	11531.5	2218.4	-745.5	20.737	12.429	-1.481	-4.453	4.141	-1.668	2266.6	22.693	1.000	300.0
700-AC- 1	12512.0	1947.1	-1254.7	21.295	13.815	-6.831	-4.109	2.860	-1.319	2280.6	26.709	1.000	300.0
700-AC- 2	12261.4	2013.6	-1225.8	21.045	13.351	-6.418	-4.109	2.860	-1.319	2259.6	25.981	1.000	300.0
700-AC- 3	12025.5	2036.2	-1298.5	20.561	14.089	-6.749	-4.109	2.860	-1.319	2262.2	25.654	1.000	300.0
700-AC- 4	12265.1	1963.6	-1311.4	20.795	13.585	-6.598	-4.109	2.860	-1.319	2216.7	25.956	1.000	300.0
700-AC- 5	12019.6	2087.8	-1012.6	20.550	13.526	-4.094	-4.109	2.860	-1.319	2255.7	25.076	1.000	300.0
700-AC- 6	11534.0	2197.5	-760.6	20.739	13.394	-2.957	-4.109	2.860	-1.309	2251.5	23.543	1.000	300.0
700-AC- 7	11451.1	2209.4	-738.3	20.760	13.447	-2.786	-4.109	2.860	-1.319	2255.6	23.429	1.000	300.0
700-AD- 1	12515.2	1994.2	-1271.0	21.326	14.650	-8.198	-3.692	1.601	-0.649	2108.6	27.460	1.000	300.0
700-AD- 2	12216.2	2004.8	-1247.1	21.076	14.561	-7.865	-3.692	1.601	-0.649	2273.2	26.599	1.000	300.0
700-AD- 3	11907.4	2016.9	-1305.7	20.943	14.900	-8.114	-3.692	1.601	-0.649	2268.2	26.202	1.000	300.0
700-AD- 4	12162.4	1960.3	-1320.6	20.826	14.400	-8.364	-3.692	1.601	-0.549	2242.5	26.529	1.000	300.0
700-AE- 1	12665.5	1833.5	-1548.6	20.435	11.557	-8.726	-5.392	3.997	-1.494	2264.5	28.766	1.000	300.0
700-AE- 2	12583.7	1866.0	-1515.9	20.285	13.874	-8.392	-5.392	3.997	-1.494	2266.1	27.562	1.000	300.0
700-AE- 3	12251.0	1848.8	-1574.0	20.202	14.207	-8.642	-5.392	3.997	-1.494	2265.3	27.221	1.000	300.0
700-AE- 4	12519.4	1799.6	-1593.7	20.035	13.707	-8.892	-5.392	3.997	-1.494	2233.5	27.502	1.000	300.0
700-AE- 5	12337.5	1754.2	-1302.5	18.520	12.029	-6.892	-5.392	3.997	-1.494	2120.6	25.304	1.000	300.0
700-AE- 6	11996.9	1843.7	-1005.4	18.733	11.633	-4.892	-5.392	3.997	-1.494	2111.7	23.972	1.000	300.0
700-AE- 7	11776.2	2231.8	-773.0	20.372	13.762	-3.091	-5.392	3.997	-1.494	2318.2	24.691	1.000	300.0
700-AE- 8	12721.4	2339.0	-815.4	21.582	15.011	-4.041	-5.392	3.997	-1.494	2417.5	27.499	1.000	300.0
700-AE- 9	11332.1	2175.3	-735.0	19.939	13.426	-2.731	-5.392	3.997	-1.494	2250.0	23.693	1.000	300.0
700-AE-10	11477.6	2205.3	-744.2	20.098	13.574	-2.804	-5.392	3.997	-1.494	2282.0	23.997	1.000	300.0
700-AF- 1	12237.1	2145.6	-576.9	21.655	13.712	-4.957	-2.825	1.723	-1.123	2292.4	25.237	1.000	300.0
700-AF- 2	12091.1	2156.8	-565.3	21.435	13.628	-4.603	-2.825	1.723	-1.123	2266.2	24.572	1.000	300.0
700-AF- 3	11734.0	2163.4	-1033.1	21.221	13.562	-4.851	-2.825	1.723	-1.123	2259.8	24.199	1.000	300.0
700-AF- 4	11720.3	2093.2	-1041.2	21.455	13.462	-5.103	-2.825	1.723	-1.123	2225.0	24.326	1.000	300.0
700-AF- 5	13069.7	2050.1	-651.8	20.416	12.348	-2.159	-2.825	1.723	-1.123	2355.2	20.930	1.000	300.0
700-AF- 6	10445.9	2007.2	-668.5	20.548	12.511	-2.295	-2.825	1.723	-1.123	2128.6	21.352	1.000	300.0
700-AF- 7	11272.6	2155.1	-738.4	21.143	13.078	-2.443	-2.825	1.723	-1.123	2195.9	22.575	1.000	300.0
700-AF- 8	11417.4	2209.1	-751.0	21.415	13.330	-2.900	-2.825	1.723	-1.123	2233.8	23.026	1.000	300.0
700-AG- 1	13378.2	2052.1	-1351.1	21.067	12.502	-7.189	-3.926	2.916	-0.547	2237.9	25.166	1.000	300.0
700-AG- 2	12773.5	2009.2	-1212.4	20.777	12.818	-7.455	-3.926	2.916	-0.547	2234.6	24.694	1.000	300.0
700-AG- 3	12119.5	2043.2	-1255.9	20.714	13.152	-7.135	-3.926	2.916	-0.547	2245.2	24.469	1.000	300.0
700-AG- 4	12179.6	1958.6	-1300.1	20.547	12.052	-7.355	-3.926	2.916	-0.547	2219.5	24.751	1.000	300.0
700-AG- 5	12285.3	2338.7	-844.1	21.516	13.344	-4.443	-3.926	2.916	-0.547	2333.5	24.051	1.000	300.0
700-AG- 6	12440.9	2321.8	-815.3	22.079	13.826	-4.385	-3.926	2.916	-0.547	2394.0	25.366	1.000	300.0
700-AG- 7	12271.9	2229.0	-694.4	21.201	12.590	-3.560	-3.926	2.916	-0.547	2333.1	23.958	1.000	300.0
700-AG- 8	11691.6	2174.3	-718.7	20.498	12.221	-3.263	-3.926	2.916	-0.547	2229.5	22.460	1.000	300.0
700-AG- 9	11397.9	2234.5	-757.4	20.703	12.093	-3.274	-3.926	2.916	-0.547	2257.0	22.387	1.000	300.0
700-AG-10	11531.7	2229.7	-745.1	20.823	12.653	-3.316	-3.926	2.916	-0.547	2253.5	22.485	1.000	300.0
700-AG-11	11511.2	2217.1	-741.4	20.519	12.554	-3.262	-3.926	2.916	-0.547	2241.6	22.289	1.000	300.0
700-AH- 1	12499.3	1987.7	-1274.0	21.542	14.767	-6.676	-4.292	2.803	-2.071	2300.6	27.918	1.000	300.0
700-AH- 2	12219.5	2009.1	-1243.6	21.292	14.684	-6.141	-4.292	2.803	-2.071	2281.3	27.183	1.000	300.0
700-AH- 3	11694.2	2023.4	-1305.5	21.209	15.017	-6.391	-4.292	2.803	-2.071	2278.4	26.815	1.000	300.0
700-AH- 4	12205.1	1954.6	-1320.0	21.042	14.517	-6.541	-4.292	2.803	-2.071	2255.9	27.126	1.000	300.0
700-AH- 5	11896.0	2006.2	-1027.6	20.494	13.844	-6.641	-4.292	2.803	-2.071	2218.0	25.695	1.000	300.0

TABLE XX. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION FOR LOAD FACTORS GREATER THAN $\eta_z = 1.0$, V = 160 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	AOS	B1S	A1S	DOS	D1S	D1C	HP	ALFA	RAD	AZM
730- 1- 1	10233.9	1019.5	44.3	12.485	3.624	0.087	0.520	-0.754	0.299	1143.9	5.945	1.000	285.0
730- 1- 2	9264.4	913.4	75.1	12.235	3.541	0.420	0.520	-0.754	0.299	1091.5	5.435	1.000	285.0
730- 1- 3	8732.8	895.5	16.6	12.152	3.874	0.170	0.520	-0.754	0.299	1069.1	5.199	1.000	285.0
730- 1- 4	6959.7	856.0	7.4	11.965	3.374	-0.080	0.520	-0.754	0.299	1058.8	5.225	1.000	285.0
730- 1- 5	16030.6	732.9	-19.9	12.501	0.480	-1.101	0.520	-0.754	0.299	1166.0	8.403	1.000	285.0
730- 1- 6	15091.1	1095.7	31.8	13.186	2.095	-1.062	0.520	-0.754	0.299	1287.0	8.984	1.000	285.0
730- 1- 7	15520.6	1191.4	20.4	13.359	2.559	-0.985	0.520	-0.754	0.299	1319.1	8.620	1.000	285.0
730- 1- 8	15499.9	1200.0	28.7	13.376	2.591	-0.938	0.520	-0.754	0.299	1321.5	8.613	1.000	285.0
731- 1- 1	10713.5	1058.0	160.3	15.813	-0.333	5.563	1.296	3.692	-2.210	1313.2	12.627	0.333	155.0
731- 1- 2	9741.5	944.1	109.6	15.563	-0.383	5.896	1.296	3.692	-2.210	1253.1	12.136	0.333	155.0
731- 1- 3	9159.6	905.7	149.9	15.690	-0.059	5.666	1.296	3.692	-2.210	1222.6	11.759	0.333	155.0
731- 1- 4	9631.1	861.2	173.6	15.313	-0.550	5.336	1.296	3.692	-2.210	1215.1	11.462	0.333	155.0
731- 1- 5	13573.0	875.7	-229.2	15.216	-2.550	2.925	1.296	3.692	-2.210	1296.0	13.060	0.300	155.0
731- 1- 6	17578.1	976.1	298.0	16.457	-3.081	4.577	1.296	3.692	-2.210	1562.3	16.119	0.333	140.0
731- 1- 7	17524.3	1053.9	-51.6	16.626	-2.200	3.713	1.296	3.692	-2.210	1503.6	15.866	0.333	153.0
731- 1- 8	17613.9	1311.8	86.0	17.162	-1.225	4.434	1.296	3.692	-2.210	1537.9	16.988	0.300	110.0
731- 1- 9	17535.1	1290.2	29.2	16.029	-1.651	4.135	1.296	3.692	-2.210	1557.0	15.912	0.333	140.0
731- 2- 1	19313.3	1298.1	225.6	14.890	2.860	-0.771	0.520	-0.754	0.299	1557.1	11.371	1.000	295.0
731- 2- 2	19325.2	1322.3	273.0	14.610	2.757	-0.619	0.520	-0.754	0.299	1517.3	10.659	1.000	295.0
731- 2- 3	17717.8	1379.0	157.7	14.567	3.000	-0.698	0.520	-0.754	0.299	1511.9	10.316	1.000	295.0
731- 2- 4	18263.8	1245.9	132.9	15.390	2.590	-0.738	0.520	-0.754	0.299	1475.6	10.410	1.000	235.0
731- 2- 5	17611.6	1185.6	39.5	14.026	2.437	-1.209	0.520	-0.754	0.299	1477.9	9.817	1.000	295.0
731- 2- 6	17533.6	1221.6	14.5	14.142	2.621	-1.292	0.520	-0.754	0.299	1463.9	9.366	1.000	295.0
731- 2- 7	17533.2	1199.7	27.1	14.076	2.511	-1.239	0.520	-0.754	0.299	1431.6	9.877	1.000	215.0
731- 3- 1	21377.4	926.6	529.1	16.880	2.860	-0.771	0.520	-0.754	0.299	1595.9	16.606	0.400	225.0
731- 3- 2	21613.9	712.2	582.0	16.610	2.757	-0.638	0.520	-0.754	0.299	1625.3	15.525	0.450	225.0
731- 3- 3	21523.8	866.7	456.2	16.567	3.000	-0.698	0.520	-0.754	0.299	1665.3	14.917	0.500	225.0
731- 3- 4	21537.8	672.2	420.7	15.390	2.590	-0.938	0.520	-0.754	0.299	1673.3	15.171	0.450	225.0
731- 3- 5	21123.0	1247.9	30.8	16.473	4.202	-1.709	0.520	-0.754	0.299	1770.1	13.707	0.500	225.0
731- 3- 6	21313.6	1152.7	10.5	16.810	4.520	-1.852	0.520	-0.754	0.299	1784.5	14.782	0.530	225.0
731- 3- 7	20754.0	1173.0	26.6	15.902	3.402	-1.768	0.520	-0.754	0.299	1680.2	12.676	1.000	210.0
731- 3- 8	21382.7	1207.7	51.4	16.366	3.979	-1.749	0.520	-0.754	0.299	1794.2	13.430	0.500	225.0

TABLE XXI. LIST OF COMPUTER RUNS FOR THE CTR-F CONFIGURATION. V = 160 KTS

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA	ALFA MAX [illegible]	RPM
751-A1- 1	23519.6	-3094.3	2192.7	19.009	-10.536	2.125	-1.830	2.030	-1.552	2135.5	170.132	0.303	330.0
751-A2- 1	10352.7	2117.9	-697.2	19.523	11.600	-2.519	-0.331	-0.111	-1.143	2131.6	13.264	1.000	295.0
751-A2- 2	10225.2	1996.2	-620.3	19.223	11.517	-2.155	-0.331	-0.111	-1.143	2025.5	12.578	1.000	295.0
751-A2- 3	9115.7	1933.8	-667.6	19.109	11.850	-2.635	-0.331	-0.111	-1.143	2060.3	12.992	1.000	295.0
751-A2- 4	10313.3	1901.6	-692.9	19.023	11.350	-2.695	-0.331	-0.111	-1.143	2052.3	12.331	1.000	295.0
751-A2- 5	11571.1	2196.6	-760.9	19.595	11.616	-2.721	-0.331	-0.111	-1.143	2250.0	13.764	1.000	295.0
751-A2- 6	11575.1	2200.5	-762.9	19.707	11.669	-2.729	-0.331	-0.111	-1.143	2262.7	13.776	1.000	295.0
751-A3- 1	10825.5	2036.1	-705.6	18.933	12.140	-3.615	-0.818	-0.777	-0.653	2199.0	12.717	1.000	295.0
751-A3- 2	10331.6	1962.1	-627.6	19.589	12.957	-3.092	-0.818	-0.777	-0.653	2110.3	12.053	1.000	295.0
751-A3- 3	9311.7	1864.2	-655.1	19.497	12.330	-3.333	-0.818	-0.777	-0.653	2052.6	11.681	1.000	330.0
751-A3- 4	9311.5	1875.7	-699.1	19.330	11.800	-3.592	-0.818	-0.777	-0.653	2065.0	11.877	1.000	295.0
751-A3- 5	11615.6	2135.8	-734.3	19.012	12.091	-3.530	-0.818	-0.777	-0.653	2247.6	13.331	1.000	295.0
751-A3- 6	11673.3	2199.9	-760.9	19.059	12.166	-3.555	-0.818	-0.777	-0.653	2271.0	13.358	1.000	295.0
751-A3- 7	11679.6	2239.0	-765.5	19.098	12.201	-3.569	-0.818	-0.777	-0.653	2276.5	13.394	1.000	295.0
751-A4- 1	10519.9	-392.7	1211.6	10.169	-10.269	3.741	0.551	-0.491	0.026	955.3	7.513	0.203	30.0
751-A4- 2	9035.6	-435.2	1137.2	9.808	-10.363	6.376	0.551	-0.491	0.026	966.6	7.462	0.200	30.0
751-A4- 3	8713.2	-396.9	937.7	9.915	-10.010	3.925	0.551	-0.491	0.026	995.9	7.136	0.203	30.0
751-A4- 4	9257.9	-450.2	1066.0	9.658	-10.510	3.576	0.561	-0.491	0.026	955.7	7.319	0.200	90.0
751-A4- 5	16316.3	-276.5	1118.6	11.668	-8.510	1.576	0.561	-0.491	0.026	1037.8	9.536	0.759	315.0
751-A4- 6	17211.5	-55.4	1316.7	13.569	-6.510	1.425	0.561	-0.491	0.026	1176.5	12.147	0.759	315.0
751-A5- 1	11253.0	2161.1	-699.1	20.168	10.760	-3.497	0.551	-0.491	0.026	2197.6	12.234	1.000	330.0
751-A5- 2	10526.9	1926.9	-619.8	19.808	10.677	-3.276	0.551	-0.491	0.026	2099.5	11.691	1.000	330.0
751-A5- 3	9713.7	1831.9	-652.7	19.815	11.010	-3.326	0.551	-0.491	0.026	2039.5	11.214	1.000	330.0
751-A5- 4	10135.7	1839.3	-691.2	19.668	10.510	-3.576	0.551	-0.491	0.026	2069.5	11.291	1.000	330.0
751-A5- 5	11556.5	2210.1	-768.1	20.329	11.022	-3.610	0.551	-0.491	0.026	2219.0	12.498	1.000	330.0
751-A5- 6	11556.5	2210.1	-76[illegible]	20.329	11.022	-3.610	0.551	-0.491	0.026	2219.0	12.498	1.000	330.0
751-A5- 7	11253.0	2161.1	-699.1	20.158	10.760	-3.437	0.551	-0.491	0.026	2197.6	12.234	1.000	330.0
751-A5- 8	10526.9	1926.9	-619.8	19.808	10.677	-3.276	0.561	-0.491	0.026	2099.5	11.691	1.000	330.0
751-A5- 9	9713.7	1831.9	-652.7	19.815	11.010	-3.326	0.561	-0.491	0.026	2039.5	11.214	1.000	330.0
751-A5-10	10135.7	1839.3	-691.2	19.668	10.510	-3.576	0.561	-0.491	0.026	2069.5	11.291	1.000	300.0
751-A5-11	11556.5	2210.1	-769.1	20.329	11.022	-3.610	0.551	-0.491	0.026	2219.0	12.498	1.000	300.0
751-A7- 1	10815.1	2121.6	-733.1	19.477	11.610	-2.566	-1.319	0.599	-1.276	2125.9	13.971	1.000	295.0
751-A7- 2	10115.1	1992.6	-623.8	19.637	11.927	-2.711	-1.319	0.599	-1.276	2109.7	12.955	1.000	295.0
751-A7- 3	9331.0	1897.2	-652.0	18.566	11.860	-2.461	-1.319	0.599	-1.276	2352.2	12.360	1.000	295.0
751-A7- 4	9255.7	1936.3	-696.3	18.377	11.360	-2.711	-1.319	0.590	-1.276	2066.6	12.609	1.000	295.0
751-A7- 5	11652.1	2192.3	-737.2	19.003	11.520	-2.708	-1.319	0.599	-1.276	2263.9	14.063	1.000	295.0
751-A7- 6	11515.5	2236.1	-762.6	19.069	11.596	-2.729	-1.319	0.599	-1.276	2257.6	14.079	1.000	295.0
751-A8- 1	10977.0	2122.6	-706.3	18.232	11.616	-2.579	-2.267	1.291	-1.610	2216.5	13.871	1.000	295.0
751-A8- 2	10135.7	2035.9	-628.7	19.062	11.511	-2.176	-2.267	1.291	-1.610	2116.2	13.244	1.000	295.0
751-A8- 3	9521.2	1916.5	-657.9	17.959	11.866	-2.466	-2.267	1.291	-1.610	2074.1	12.766	1.000	295.0
751-A8- 4	9771.1	1917.1	-700.9	17.792	11.366	-2.696	-2.267	1.291	-1.610	2037.6	12.997	1.000	295.0
751-A8- 5	11675.9	2193.6	-738.9	19.626	11.509	-2.593	-2.267	1.291	-1.610	2271.8	14.397	1.000	295.0
751-A8- 6	11517.8	2235.8	-766.0	18.469	11.567	-2.711	-2.267	1.291	-1.610	2273.7	14.623	1.000	295.0
751-A9- 1	10772.7	2115.3	-698.0	18.765	11.016	-2.968	-1.342	0.902	-0.667	2195.6	13.108	1.000	295.0
751-A9- 2	10238.6	1978.0	-617.3	18.515	10.933	-2.615	-1.342	0.902	-0.667	2095.7	12.658	1.000	295.0
751-A9- 3	9517.8	1894.7	-667.2	18.632	11.266	-2.865	-1.342	0.902	-0.667	2019.1	11.981	1.000	295.0
751-A9- 4	9772.6	1891.3	-690.7	18.265	10.766	-3.115	-1.342	0.902	-0.667	2069.1	12.217	1.000	295.0
751-A9- 5	11667.6	2192.7	-739.3	18.934	11.057	-3.136	-1.342	0.902	-0.667	2261.0	13.598	1.000	295.0
751-A9- 6	11637.1	2198.6	-760.6	18.992	11.078	-3.141	-1.342	0.902	-0.667	2263.6	13.599	1.000	245.0
751-A9- 7	11513.1	2216.0	-767.9	19.006	11.141	-3.167	-1.342	0.902	-0.667	2255.0	13.672	1.000	295.0
751-A0- 1	11312.2	2160.0	-606.8	13.359	10.336	-1.731	-1.930	2.080	-1.659	2231.2	16.057	1.000	295.0
751-A0- 2	10333.3	2021.1	-617.0	19.229	10.881	-1.658	-1.930	2.080	-1.659	2166.5	13.345	1.000	295.0
751-A0- 3	9512.3	1927.3	-665.6	18.716	11.186	-1.708	-1.930	2.080	-1.659	2036.5	12.932	1.000	295.0
751-A0- 4	10116.0	1939.9	-677.6	18.969	10.686	-1.958	-1.930	2.080	-1.659	2093.3	13.191	1.000	295.0
751-A0- 5	11663.7	2196.9	-742.1	19.121	10.965	-2.029	-1.930	2.080	-1.659	2265.6	16.661	1.000	295.0
751-A0- 6	11515.1	2296.2	-765.2	19.149	10.907	-2.029	-1.930	2.080	-1.659	2277.1	16.926	1.000	295.0
751-AA- 1	10355.3	2120.3	-700.2	19.031	12.163	-2.095	-1.296	0.279	-1.836	2206.6	16.017	1.000	295.0
751-AA- 2	10153.7	1996.9	-625.6	19.791	12.060	-1.762	-1.296	0.279	-1.846	2120.6	13.316	1.000	295.0
751-AA- 3	9653.6	1976.3	-652.6	18.668	12.613	-2.012	-1.296	0.279	-1.846	2065.3	12.806	1.000	295.0
751-AA- 4	9363.9	1912.7	-697.6	19.931	11.913	-2.242	-1.296	0.279	-1.846	2076.6	13.047	1.000	295.0
751-AA- 5	11653.9	2185.6	-738.6	19.118	12.016	-2.284	-1.296	0.279	-1.846	2250.1	16.597	1.000	295.0
751-AA- 6	11555.9	2271.6	-763.9	19.178	12.107	-2.302	-1.296	0.279	-1.846	2269.1	16.630	1.000	295.0

TABLE XXII. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION. V = 160 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	A0S	A1S	B1S	D0S	C1S	D1C	HP	ALFA	RAD	AZM
756- 1- 1	10519.6	2022.0	-675.8	17.878	11.732	-6.937	0.799	-3.563	1.652	2159.5	10.132	1.000	315.0
756- 1- 2	9771.2	1919.8	-613.7	17.628	11.659	-6.566	0.799	-3.563	1.652	2051.7	9.717	1.000	315.0
756- 1- 3	8572.1	1675.4	-659.6	17.565	11.982	-6.916	0.799	-3.563	1.652	1961.9	9.002	1.000	315.0
756- 1- 4	8156.7	1732.3	-690.3	17.578	11.682	-5.766	0.799	-3.563	1.652	1997.9	9.181	1.000	315.0
756- 1- 5	11313.0	2195.4	-777.5	18.171	12.167	-6.678	0.799	-3.563	1.652	2276.0	11.039	1.000	330.0
756- 1- 6	11558.7	2136.1	-768.6	18.162	12.027	-6.343	0.799	-3.563	1.652	2273.2	11.055	1.000	330.0
756- 1- 7	11605.1	2206.8	-765.6	18.168	12.056	-6.319	0.799	-3.563	1.652	2279.1	11.070	1.000	330.0
756- 2- 1	9351.4	1714.5	-646.8	17.880	11.732	-6.053	0.799	-3.563	1.652	1995.2	9.632	1.000	330.0
756- 2- 2	8512.0	1561.8	-563.3	17.630	11.649	-5.720	0.799	-3.563	1.652	1897.9	9.140	1.000	315.0
756- 2- 3	7710.5	1417.7	-580.2	17.567	11.982	-5.970	0.799	-3.563	1.652	1929.2	8.730	1.000	315.0
756- 2- 4	8250.5	1450.6	-618.0	17.360	11.482	-6.220	0.799	-3.563	1.652	1850.5	8.949	1.000	315.0
756- 2- 5	11373.0	2156.5	-703.5	18.775	12.177	-6.287	0.799	-3.563	1.652	2252.6	11.336	1.000	330.0
756- 2- 6	11159.8	2149.0	-697.6	18.751	12.136	-6.362	0.799	-3.563	1.652	2269.8	11.321	1.000	330.0
756- 2- 7	11526.4	2215.4	-765.3	18.962	12.457	-6.257	0.799	-3.563	1.652	2289.9	11.562	1.000	330.0
756- 3- 1	11355.4	2201.6	-678.7	20.129	10.722	-1.656	0.362	0.333	-1.315	2248.3	13.046	1.000	245.0
756- 3- 2	10533.8	2049.2	-594.0	19.879	10.618	-1.351	0.362	0.333	-1.315	2167.2	12.303	1.000	285.0
756- 3- 3	9799.9	1961.9	-621.8	19.796	10.972	-1.631	0.362	0.333	-1.315	2042.7	11.817	1.000	245.0
756- 3- 4	10223.0	1965.6	-620.3	19.629	10.672	-1.951	0.362	0.333	-1.315	2099.9	12.035	1.000	245.0
756- 3- 5	11611.8	2273.2	-750.2	20.110	10.727	-2.069	0.362	0.333	-1.315	2256.7	13.132	1.000	245.0
756- 4- 1	10941.7	2097.4	-663.6	19.757	11.785	-3.313	1.179	-2.441	-0.426	2166.5	11.764	1.000	330.0
756- 4- 2	10158.9	1946.9	-585.6	19.507	11.792	-2.979	1.179	-2.441	-0.426	2070.4	11.067	1.000	330.0
756- 4- 3	9627.1	1836.0	-612.7	19.423	12.035	-3.229	1.179	-2.441	-0.426	2036.8	10.719	1.000	330.0
756- 4- 4	9937.5	1851.1	-654.8	19.257	11.935	-3.470	1.179	-2.441	-0.426	2021.0	10.919	1.000	330.0
756- 4- 5	11553.9	2233.9	[illegible]	20.008	12.059	-3.701	1.179	-2.441	-0.426	2239.1	12.256	1.000	330.0
756- 5- 1	9659.9	1795.0	-620.0	19.336	11.838	-5.372	2.275	-4.419	1.224	2027.2	9.998	1.000	330.0
756- 5- 2	8835.7	1620.7	-566.2	19.096	11.755	-5.338	2.275	-4.419	1.224	1928.6	9.436	1.000	315.0
756- 5- 3	8124.3	1498.5	-573.6	19.001	12.088	-5.298	2.275	-4.419	1.224	1866.0	9.111	1.000	315.0
756- 5- 4	8571.3	1532.4	-601.1	18.836	11.585	-5.538	2.275	-4.419	1.224	1884.1	9.228	1.000	315.0
756- 5- 5	11653.5	2169.6	-728.1	20.063	12.263	-5.756	2.275	-4.419	1.224	2250.4	11.656	1.000	330.0
756- 5- 6	11451.9	2117.5	-713.6	19.881	11.935	-5.737	2.275	-4.419	1.224	2222.9	11.356	1.000	330.0
756- 5- 7	11699.0	2233.9	-766.0	20.178	12.471	-5.939	2.275	-4.419	1.224	2270.0	11.537	1.000	330.0
756- 7- 1	11218.1	2192.9	-675.4	20.757	9.896	-2.978	1.196	-0.056	0.031	2253.4	11.715	1.000	245.0
756- 7- 2	10335.7	2001.3	-590.3	20.537	9.811	-2.595	1.196	-0.056	0.031	2152.7	10.680	1.000	245.0
756- 7- 3	9637.7	1872.7	-620.0	20.626	10.166	-2.765	1.196	-0.056	0.031	2073.4	10.179	1.000	245.0
756- 7- 4	10386.0	1992.9	-663.6	20.257	9.666	-2.935	1.196	-0.056	0.031	2100.8	10.268	1.000	245.0
756- 7- 5	11672.9	2137.3	-750.2	20.713	9.776	-3.212	1.196	-0.056	0.031	2273.1	11.671	1.000	245.0
756- 7- 6	11691.8	2206.3	-746.3	20.760	9.807	-3.156	1.196	-0.056	0.031	2277.8	11.418	1.000	245.0
756- 8- 1	11821.0	2334.9	-688.6	20.637	10.759	-3.962	1.666	-1.686	0.585	2289.7	11.493	1.000	300.0
756- 8- 2	10968.0	2147.8	-617.1	20.387	10.676	-3.698	1.656	-1.686	0.585	2192.7	10.796	1.000	300.0
756- 8- 3	10220.6	2079.6	-658.0	20.303	11.009	-3.558	1.656	-1.686	0.585	2124.1	10.478	1.000	300.0
756- 8- 4	10708.3	2047.9	-696.4	20.137	10.509	[illegible]	1.666	-1.686	0.585	2141.6	10.971	1.000	300.0
756- 8- 5	11976.7	2213.6	-752.6	20.431	10.669	[illegible]	1.666	-1.686	0.585	2241.0	11.229	1.000	300.0
756- 8- 5	11976.7	2213.6	-752.6	20.431	10.669	[illegible]	1.666	-1.686	0.585	2241.0	11.229	1.000	300.0
756- 8- 7	10733.5	2046.4	-696.4	20.137	10.509	[illegible]	1.666	-1.686	0.585	2140.8	10.568	1.000	300.0
756- 8- 8	11512.0	2217.8	-752.9	20.434	10.612	-4.309	1.666	-1.686	0.585	2263.3	11.264	1.000	300.0

TABLE XXII - Continued

CASE NO	[illegible]	FY	[illegible]	PITCH HORN CONTROLS AOS	DIS	AIS	SERVO FLAP CONTROLS DOS	DIS	DIC	HP	ALFA MAX ALFA	RAD	RPM
756- 9- 1	11663.1	2224.8	-676.6	20.463	10.936	-5.162	2.065	-2.813	1.692	2265.1	10.612	1.000	330.0
756- 9- 2	10571.4	2063.9	-611.4	20.213	10.851	-5.008	2.065	-2.813	1.692	2156.9	9.961	1.000	300.0
756- 9- 3	9839.7	1938.0	-654.6	20.129	11.196	-5.259	2.065	-2.813	1.692	2066.5	9.619	1.000	300.0
756- 9- 4	10294.2	1957.4	-696.3	19.963	10.696	-5.538	2.065	-2.813	1.692	2112.5	9.735	1.000	315.0
756- 9- 5	11532.3	2209.8	-751.2	20.392	10.891	-5.752	2.065	-2.813	1.692	2259.8	10.699	1.000	330.0
756- 9- 5	11532.3	2209.8	-751.2	20.392	10.891	-5.752	2.065	-2.813	1.692	2259.8	10.699	1.000	330.0
756- 9- 5	11532.3	2209.8	-751.2	20.392	10.891	-5.752	2.065	-2.813	1.692	2259.8	10.699	1.000	300.0
756- 9- 8	11663.1	2224.8	-676.6	20.463	10.936	-5.162	2.065	-2.813	1.692	2265.1	10.612	1.000	330.0
756- 9- 9	10571.4	2063.9	-611.4	20.213	10.851	-5.008	2.065	-2.813	1.692	2156.9	9.961	1.000	300.0
756- 9-10	9839.7	1938.0	-654.6	20.129	11.196	-5.259	2.065	-2.813	1.692	2066.5	9.619	1.000	300.0
756- 9-11	10294.2	1957.4	-696.3	19.963	10.696	-5.538	2.065	-2.813	1.692	2112.5	9.735	1.000	315.0
756- 9-12	11532.3	2209.8	-751.2	20.392	10.891	-5.752	2.065	-2.813	1.692	2259.8	10.699	1.000	330.0
756-10- 1	11872.6	2190.7	-651.7	20.578	9.665	-3.176	1.266	0.005	0.678	2228.6	10.263	1.000	295.0
756-10- 2	9960.1	1917.2	-573.1	20.629	9.302	-3.061	1.266	0.005	0.678	2118.8	9.711	1.000	295.0
756-10- 3	9716.0	1771.6	-675.2	20.366	9.716	-3.291	1.266	0.005	0.678	2018.5	9.273	1.000	295.0
756-10- 4	9719.5	1812.0	-666.9	20.178	9.216	-3.561	1.266	0.005	0.678	2066.0	9.490	1.000	295.0
756-10- 5	11516.5	2136.6	-755.1	20.705	9.323	-3.673	1.266	0.005	0.678	2297.9	10.761	1.000	295.0
756-10- 6	11512.4	2207.1	-759.3	20.766	9.325	-3.835	1.266	0.005	0.678	2296.1	10.757	1.000	295.0
756-11- 1	11313.8	2219.7	-665.3	20.547	10.115	-4.209	1.598	-1.217	1.065	2259.8	10.556	1.000	330.0
756-11- 2	10437.8	2066.0	-596.2	20.337	10.032	-3.876	1.598	-1.217	1.065	2198.1	10.026	1.000	300.0
756-11- 3	9753.1	1913.0	-638.2	20.264	10.365	-4.176	1.598	-1.217	1.065	2041.7	9.607	1.000	300.0
756-11- 4	10213.3	1941.1	-673.2	20.097	9.865	-4.376	1.598	-1.217	1.065	2104.8	9.915	1.000	300.0
756-11- 5	11477.5	2207.7	-752.8	20.635	10.003	-4.552	1.598	-1.217	1.065	2259.3	10.665	1.000	330.0
756-11- 5	11477.5	2207.7	-752.8	20.635	10.003	-4.552	1.598	-1.217	1.065	2259.3	10.665	1.000	330.0
756-11- 5	11477.8	2207.7	-752.8	20.635	10.003	-4.552	1.598	-1.217	1.065	2259.3	10.665	1.000	330.0
756-12- 1	11136.5	2172.8	-464.2	20.457	10.246	-5.259	1.897	-2.062	1.898	2240.1	10.159	1.000	300.0
756-12- 2	10234.4	1961.4	-595.2	20.207	10.163	-4.926	1.897	-2.062	1.898	2132.9	9.351	1.000	315.0
756-12- 3	9970.2	1855.6	-633.5	20.123	10.496	-5.176	1.897	-2.062	1.898	2059.7	9.057	1.000	300.0
756-12- 4	9758.8	1842.6	-660.5	19.957	9.556	-5.426	1.897	-2.062	1.898	2079.9	9.271	1.000	300.0
756-12- 5	11475.6	2196.1	-752.9	20.411	10.109	-5.750	1.897	-2.062	1.898	2256.8	10.254	1.000	300.0
756-12- 6	11441.9	2202.7	-757.8	20.461	10.152	-5.716	1.897	-2.062	1.898	2263.2	10.296	1.000	300.0
756-13- 1	11777.0	2262.1	-706.0	20.917	10.750	-1.735	1.096	-0.180	-1.251	2304.9	13.076	1.000	295.0
756-13- 2	10703.6	2126.6	-620.9	20.667	10.667	-1.402	1.096	-0.180	-1.251	2232.0	12.276	1.000	295.0
756-13- 3	10233.2	2020.6	-651.6	20.589	11.000	-1.652	1.096	-0.180	-1.251	2149.1	11.816	1.000	295.0
756-13- 4	10034.2	2034.1	-679.9	20.417	10.500	-1.102	1.096	-0.180	-1.251	2154.4	12.043	1.000	295.0
756-13- 5	11493.1	2212.5	-750.9	20.757	10.709	-2.011	1.096	-0.180	-1.251	2263.7	12.777	1.000	295.0
756-14- 1	12199.2	2361.7	-706.4	20.736	12.249	-3.406	1.801	-2.624	-0.377	2325.4	12.852	1.000	300.0
756-14- 2	11421.1	2232.0	-637.3	20.466	11.566	-3.011	1.801	-2.624	-0.377	2234.9	12.102	1.000	300.0
756-14- 3	10732.8	2160.9	-682.4	20.403	12.299	-3.323	1.801	-2.624	-0.377	2179.3	11.659	1.000	300.0
756-14- 4	11173.0	2115.5	-720.7	20.236	11.759	-3.573	1.801	-2.624	-0.377	2185.0	11.901	1.000	300.0
756-14- 5	11447.6	2212.0	-749.6	20.413	11.957	-3.677	1.801	-2.624	-0.377	2233.8	12.229	1.000	300.0
756-15- 1	11703.1	2271.9	-695.0	20.475	12.311	-5.506	2.400	-4.316	1.270	2305.3	11.676	1.000	300.0
756-15- 2	10962.9	2133.4	-631.8	20.225	12.228	-5.173	2.400	-4.316	1.270	2216.6	10.928	1.000	300.0
756-15- 3	10699.4	2019.2	-676.5	20.142	12.561	-5.423	2.400	-4.316	1.270	2140.2	10.481	1.000	315.0
756-15- 4	10722.6	2037.7	-711.5	19.975	12.061	-5.673	2.400	-4.316	1.270	2167.3	10.606	1.000	300.0
756-15- 5	11518.1	2214.1	-754.1	20.363	12.336	-5.816	2.400	-4.316	1.270	2273.6	11.459	1.000	300.0

TABLE XXII - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	C1C	HP	ALFA MAX ALFA	PSI	AZM
756-A1- 1	13121.1	2727.4	-768.3	20.168	10.763	-3.637	0.551	-0.491	0.026	2551.9	16.196	1.000	255.0
756-A1- 2	13171.0	2531.8	-706.0	19.808	10.580	-3.375	0.551	-0.631	0.026	2467.5	13.298	1.000	255.0
756-A1- 3	12515.6	2637.0	-770.1	19.915	11.011	-3.336	0.551	-0.631	0.026	2336.9	12.651	1.000	245.0
756-A1- 4	12125.0	2455.9	-807.8	19.668	10.513	-3.576	0.551	-0.671	0.026	2400.9	12.332	1.000	235.0
756-A1- 5	11232.5	2112.5	-696.2	18.807	9.858	-3.256	0.551	-0.651	0.026	2163.5	11.299	1.000	215.0
756-A1- 6	11511.0	2219.4	-766.7	19.128	10.170	-3.637	0.561	-0.491	0.026	2232.1	11.673	1.000	255.0
756-A2- 1	13372.0	2977.4	-773.7	19.369	10.936	-1.731	-1.810	2.080	-1.659	2557.3	17.353	1.000	273.0
756-A2- 2	12765.6	2456.9	-711.6	18.798	10.851	-1.658	-1.810	2.080	-1.659	2491.0	16.559	1.000	273.0
756-A2- 3	12364.2	2629.1	-772.0	19.716	11.196	-1.709	-1.810	2.080	-1.659	2636.7	15.957	1.000	273.0
756-A2- 4	12319.6	2310.1	-816.6	18.969	10.686	-1.959	-1.810	2.080	-1.659	2636.9	16.754	1.000	273.0
756-A2- 5	11227.2	2109.6	-705.1	17.831	10.163	-1.591	-1.810	2.080	-1.659	2215.0	14.565	1.000	273.0
756-A2- 6	11335.0	2298.7	-762.9	18.091	10.566	-1.702	-1.810	2.080	-1.659	2291.7	14.963	1.000	273.0
756-A3- 1	13358.9	2966.5	-735.0	18.877	11.610	-2.966	-1.319	0.599	-1.276	2969.6	16.999	1.000	245.0
756-A3- 2	13234.7	2922.5	-600.5	18.627	11.527	-2.711	-1.319	0.599	-1.276	2692.6	16.150	1.000	245.0
756-A3- 3	12532.5	2696.9	-752.6	18.566	11.860	-2.661	-1.319	0.599	-1.276	2619.0	15.660	1.000	255.0
756-A3- 4	11375.7	2669.0	-787.1	18.377	11.569	-2.711	-1.319	0.599	-1.276	2435.1	15.736	1.000	245.0
756-A3- 5	11153.2	2351.8	-672.7	17.290	10.362	-2.616	-1.319	0.593	-1.276	2158.5	13.653	1.000	215.0
756-A3- 6	11525.7	2206.0	-766.9	17.751	11.199	-2.512	-1.319	0.500	-1.276	2245.0	13.983	1.000	215.0
756-A4- 1	13316.2	2570.1	-730.1	18.292	11.616	-2.529	-2.267	1.291	-1.610	2970.6	17.671	1.000	210.0
756-A4- 2	13315.2	2920.1	-730.1	18.292	11.616	-2.529	-2.267	1.291	-1.610	2970.6	17.671	1.000	210.0
756-A4- 3	13161.1	2695.3	-673.0	18.062	11.531	-2.196	-2.267	1.291	-1.610	2533.6	16.669	1.000	210.0
756-A4- 4	12556.1	2667.4	-767.5	17.959	11.966	-2.666	-2.267	1.291	-1.610	2666.2	16.060	1.000	210.0
756-A4- 5	13132.1	2612.0	-782.6	17.792	11.566	-2.596	-2.267	1.291	-1.610	2659.0	16.331	1.000	230.0
756-A4- 6	11115.8	2057.8	-695.0	16.766	10.519	-2.378	-2.267	1.291	-1.610	2169.1	14.060	1.000	210.0
756-A4- 7	11512.4	2236.5	-766.5	17.195	11.229	-2.514	-2.267	1.291	-1.610	2275.0	14.990	1.000	285.0
756-A8- 1	14118.7	2611.7	-708.6	18.810	12.139	-3.615	-0.818	-0.777	-0.653	2981.0	16.752	1.000	255.0
756-A8- 2	13512.6	2568.9	-651.2	18.580	12.055	-3.032	-0.818	-0.777	-0.653	2515.6	15.262	1.000	295.0
756-A8- 3	12223.7	2820.9	-735.1	18.697	12.388	-3.332	-0.818	-0.777	-0.653	2657.6	14.531	1.000	285.0
756-A8- 4	13174.7	2690.0	-769.1	18.310	11.898	-3.542	-0.818	-0.777	-0.653	2466.7	14.879	1.000	245.0
756-A8- 5	11316.6	2000.5	-661.5	17.067	10.768	-3.227	-0.818	-0.777	-0.653	2139.3	12.256	1.000	255.0
756-A9- 1	12156.9	2225.5	-653.8	17.567	11.018	-3.060	-0.818	-0.777	-0.653	2291.9	13.383	1.000	235.0
756-A9- 2	11212.0	2096.4	-581.5	17.317	10.935	-2.727	-0.818	-0.777	-0.653	2199.9	12.557	1.000	255.0
756-A9- 3	10557.5	1990.5	-619.9	17.236	11.268	-2.977	-0.818	-0.777	-0.653	2122.5	11.976	1.000	255.0
756-A9- 4	11322.3	2002.3	-667.0	17.067	10.768	-3.227	-0.813	-0.777	-0.653	2139.9	12.266	1.000	295.0
756-A9- 5	11571.4	2269.3	-766.2	17.867	11.994	-3.935	-0.818	-0.777	-0.653	2299.7	13.160	1.000	285.0

TABLE XXII - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
756-AA- 1	13716.6	2572.6	-743.6	19.523	11.595	-2.519	-0.391	-0.111	-1.143	2529.1	16.552	1.000	285.0
756-AA- 2	13637.9	2560.0	-687.8	19.273	11.516	-2.145	-0.391	-0.111	-1.143	2459.0	15.592	1.000	285.0
756-AA- 3	12706.1	2437.6	-755.6	19.190	11.849	-2.435	-0.391	-0.111	-1.143	2409.6	14.619	1.000	285.0
756-AA- 4	12337.5	2453.8	-791.3	19.023	11.349	-2.645	-0.391	-0.111	-1.143	2409.0	15.172	1.000	285.0
756-AA- 5	11033.5	2035.8	-680.0	17.949	10.397	-2.335	-0.391	-0.111	-1.143	2122.3	12.843	1.000	285.0
756-AA- 6	11923.4	2207.8	-747.4	18.418	11.094	-2.520	-0.391	-0.111	-1.143	2279.9	13.473	1.000	285.0
756-AB- 1	13473.3	2594.8	-719.4	18.765	11.016	-2.946	-1.342	0.902	-0.667	2542.9	16.107	1.000	285.0
756-AB- 2	13254.4	2537.0	-682.3	18.515	10.933	-2.613	-1.342	0.902	-0.667	2470.5	15.304	1.000	285.0
756-AB- 3	12551.1	2486.9	-750.6	19.432	11.266	-2.843	-1.342	0.902	-0.667	2421.0	14.668	1.000	285.0
756-AB- 4	13049.5	2452.9	-786.7	18.265	10.766	-3.113	-1.342	0.902	-0.667	2420.4	14.994	1.000	285.0
756-AB- 5	11454.1	2062.2	-692.7	17.278	9.467	-2.932	-1.342	0.902	-0.667	2146.8	12.885	1.000	285.0
756-AB- 6	11517.8	2210.7	-743.2	17.692	10.563	-2.961	-1.342	0.902	-0.667	2237.2	13.393	1.000	285.0
756-AC- 1	13737.5	2517.1	-725.6	19.001	12.161	-2.095	-1.296	0.279	-1.846	2549.5	17.886	1.000	285.0
756-AC- 2	13236.0	2479.3	-670.2	18.751	12.030	-1.752	-1.296	0.279	-1.836	2481.9	17.048	1.000	285.0
756-AC- 3	12544.7	2460.8	-745.1	18.668	12.413	-2.012	-1.296	0.279	-1.886	2445.8	16.288	1.000	285.0
756-AC- 4	13034.8	2406.5	-778.4	18.501	11.913	-2.262	-1.296	0.279	-1.896	2438.2	16.672	1.000	285.0
756-AC- 5	11337.8	2073.3	-713.2	17.513	11.175	-1.992	-1.296	0.279	-1.816	2193.3	14.330	1.000	285.0
756-AC- 6	11918.3	2196.7	-760.7	17.894	11.722	-2.061	-1.296	0.279	-1.886	2257.2	14.676	1.000	285.0
756-AC- 7	11503.1	2211.3	-746.4	17.932	11.803	-2.078	-1.296	0.279	-1.886	2266.4	14.724	1.000	285.0
756-AD- 1	12542.3	2418.6	-730.5	18.928	10.951	-1.672	-1.365	1.574	-1.512	2417.4	15.573	1.000	270.0
756-AD- 2	11744.7	2330.3	-658.4	18.579	10.769	-1.359	-1.365	1.574	-1.512	2323.6	14.733	1.000	285.0
756-AD- 3	11435.2	2222.4	-702.8	18.495	11.103	-1.609	-1.365	1.574	-1.512	2262.5	14.109	1.000	285.0
756-AD- 4	11574.3	2222.2	-747.6	18.328	10.603	-1.859	-1.365	1.574	-1.512	2275.0	14.459	1.000	285.0
756-AD- 5	11495.1	2208.2	-744.7	18.300	10.593	-1.855	-1.365	1.574	-1.512	2264.9	14.373	1.000	285.0
756-AD- 5	11495.1	2208.2	-744.7	18.300	10.593	-1.855	-1.365	1.574	-1.512	2264.9	14.373	1.000	285.0
756-AD- 5	11495.1	2208.2	-744.7	18.300	10.593	-1.855	-1.365	1.574	-1.512	2264.9	14.373	1.000	285.0
756-AE- 1	12723.1	2417.8	-727.0	18.632	11.469	-2.400	-0.834	0.123	-1.221	2398.5	15.104	1.000	285.0
756-AE- 2	11916.9	2327.8	-667.2	19.392	11.395	-2.066	-0.834	0.123	-1.221	2308.4	14.217	1.000	285.0
756-AE- 3	11139.3	2238.7	-707.8	18.299	11.719	-2.316	-0.834	0.123	-1.221	2247.6	13.561	1.000	285.0
756-AE- 4	11659.5	2232.7	-750.9	18.132	11.219	-2.566	-0.834	0.123	-1.221	2257.2	13.882	1.000	285.0
756-AE- 5	11480.3	2205.2	-743.4	18.095	11.217	-2.543	-0.834	0.123	-1.221	2218.1	13.707	1.000	285.0
756-AF- 1	12471.8	2394.6	-772.9	17.966	11.519	-2.493	-1.708	0.774	-1.332	2395.3	15.339	1.000	285.0
756-AF- 2	11675.7	2284.2	-655.5	17.716	11.432	-2.070	-1.708	0.774	-1.332	2303.4	14.470	1.000	285.0
756-AF- 3	10914.2	2197.4	-699.2	17.633	11.765	-2.320	-1.708	0.774	-1.332	2243.4	13.858	1.000	285.0
756-AF- 4	11445.9	2194.0	-743.5	17.466	11.265	-2.570	-1.708	0.774	-1.332	2254.0	14.151	1.000	285.0
756-AF- 5	11511.2	2214.2	-747.6	17.518	11.325	-2.578	-1.708	0.774	-1.332	2267.2	14.241	1.000	285.0
756-AG- 1	12012.9	2455.6	-734.1	19.298	11.422	-2.376	0.039	-0.527	-1.110	2391.9	14.792	1.000	285.0
756-AG- 2	11442.6	2339.9	-668.5	19.048	11.339	-2.043	0.039	-0.527	-1.110	2301.4	13.797	1.000	285.0
756-AG- 3	11143.3	2241.6	-713.6	18.965	11.672	-2.313	0.039	-0.527	-1.110	2236.9	13.093	1.000	285.0
756-AG- 4	11749.6	2247.2	-758.3	18.798	11.172	-2.563	0.039	-0.527	-1.110	2251.9	13.437	1.000	285.0
756-AG- 5	11481.5	2203.9	-762.1	18.720	11.153	-2.503	0.039	-0.527	-1.110	2222.1	13.176	1.000	285.0
756-AH- 1	12482.4	2467.3	-730.0	18.571	10.908	-2.420	-0.854	0.411	-0.657	2403.6	14.547	1.000	285.0
756-AH- 2	12062.2	2367.4	-663.7	18.321	10.825	-2.487	-0.854	0.411	-0.657	2309.9	13.700	1.000	285.0
756-AH- 3	11249.1	2254.6	-707.1	18.238	11.158	-2.737	-0.854	0.411	-0.657	2245.7	13.068	1.000	285.0
756-AH- 4	11782.7	2252.9	-751.2	18.071	10.658	-2.987	-0.854	0.411	-0.657	2257.1	13.355	1.000	285.0
756-AH- 5	11532.8	2208.8	-762.2	17.987	10.655	-2.968	-0.854	0.411	-0.657	2226.4	13.097	1.000	285.0
756-AI- 1	12472.7	2398.6	-722.6	18.694	12.033	-1.777	-0.814	-0.166	-1.789	2394.2	15.005	1.000	285.0
756-AI- 2	11713.5	2270.8	-658.2	18.444	11.950	-1.633	-0.814	-0.166	-1.789	2292.4	14.679	1.000	285.0
756-AI- 3	10441.9	2201.1	-703.3	18.361	12.283	-1.893	-0.814	-0.166	-1.789	2238.5	14.039	1.000	285.0
756-AI- 4	11452.0	2198.5	-745.2	19.194	11.783	-2.143	-0.814	-0.166	-1.789	2249.6	14.352	1.000	285.0
756-AI- 5	11517.5	2216.5	-748.1	18.236	11.832	-2.144	-0.814	-0.166	-1.789	2260.9	14.429	1.000	285.0
756-AI- 5	11517.5	2216.5	-749.1	19.236	11.932	-2.144	-0.814	-0.166	-1.789	2260.9	14.429	1.000	285.0
756-AI- 5	11517.5	2216.5	-748.1	14.216	11.932	-2.144	-0.814	-0.166	-1.789	2260.9	14.429	1.000	285.0
756-AK- 1	12378.8	2474.3	-738.3	18.510	10.346	-3.242	-0.874	0.700	-0.092	2403.2	13.869	1.000	285.0
756-AK- 2	11980.4	2359.2	-663.1	18.260	10.262	-2.938	-0.874	0.700	-0.092	2302.3	13.009	1.000	285.0
756-AK- 3	11495.9	2234.8	-706.4	18.176	10.596	-3.158	-0.874	0.700	-0.092	2243.4	12.422	1.000	285.0
756-AK- 4	11731.4	2239.7	-749.9	19.010	10.096	-3.409	-0.874	0.700	-0.092	2246.9	12.702	1.000	285.0
756-AK- 5	11510.3	2211.7	-748.0	17.977	10.152	-3.397	-0.874	0.700	-0.092	2227.4	12.530	1.000	285.0
756-AL- 1	12430.0	2411.2	-718.5	20.631	11.331	-2.388	1.786	-1.829	-0.890	2341.5	13.445	1.000	300.0
756-AL- 2	11356.7	2270.8	-648.7	20.361	11.748	-2.055	1.786	-1.829	-0.890	2245.3	12.554	1.000	300.0
756-AL- 3	10772.7	2160.6	-696.0	20.297	11.581	-2.305	1.786	-1.829	-0.890	2175.7	11.963	1.000	300.0
756-AL- 4	11279.0	2167.9	-729.6	20.131	11.081	-2.555	1.786	-1.829	-0.890	2190.3	12.256	1.000	300.0
756-AL- 5	11528.1	2218.4	-750.2	20.218	11.139	-2.62.	1.786	-1.829	-0.890	2222.2	12.497	1.000	300.0
756-ZJ- 1	12494.5	2367.0	-733.9	18.410	11.856	-3.286	-0.312	-1.205	-0.690	2374.8	13.689	1.000	285.0
756-ZJ- 2	11665.4	2263.2	-666.2	18.160	11.763	-2.953	-0.312	-1.205	-0.690	2283.0	12.842	1.000	285.0
756-ZJ- 3	10880.2	2162.5	-706.7	18.077	12.096	-3.203	-0.312	-1.205	-0.690	2218.0	12.235	1.000	285.0
756-ZJ- 4	11399.0	2168.2	-748.0	17.910	11.596	-3.453	-0.312	-1.205	-0.690	2231.9	12.516	1.000	285.0
756-ZJ- 5	11531.2	2221.6	-751.4	18.051	11.777	-3.423	-0.312	-1.205	-0.690	2263.0	12.702	1.000	285.0
756-ZJ- 6	11470.6	2207.7	-749.4	18.022	11.734	-3.406	-0.312	-1.205	-0.690	2254.7	12.651	1.000	285.0

TABLE XXIII. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION FOR LOAD FACTORS GREATER THAN η_z = 1.0, V = 120 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	AOS	BIS	AIS	DOS	DIS	DIC	HP	ALFA	RAD	AZM
757- 1- 1	12116.5	2355.3	-721.8	20.892	11.131	-5.585	2.065	-2.813	1.682	2374.9	11.334	1.000	300.0
757- 1- 2	11270.6	2205.8	-659.4	20.642	11.048	-5.252	2.065	-2.813	1.682	2277.3	10.556	1.000	300.0
757- 1- 3	10550.6	2096.9	-705.4	20.559	11.381	-5.532	2.065	-2.813	1.682	2211.1	10.219	1.000	300.0
757- 1- 4	11070.2	2117.1	-745.0	20.392	10.881	-5.752	2.065	-2.813	1.682	2235.0	10.392	1.000	300.0
757- 1- 5	13017.8	2002.9	-677.9	19.538	8.127	-6.039	2.065	-2.813	1.682	2212.3	11.338	1.000	300.0
757- 1- 6	13403.7	2169.5	-746.6	20.064	8.917	-6.238	2.065	-2.813	1.682	2312.0	11.913	1.000	300.0
757- 1- 7	13435.6	2181.5	-748.1	20.098	8.959	-6.228	2.065	-2.813	1.682	2319.1	11.952	1.000	300.0
757- 1- 8	13491.9	2208.2	-744.2	20.181	9.063	-6.207	2.065	-2.813	1.682	2334.5	12.038	1.000	300.0
757- 2- 1	15269.3	2710.1	-391.7	22.934	10.922	-4.142	1.666	-1.686	0.585	2796.1	17.413	1.000	300.0
757- 2- 2	15980.7	2767.1	-391.3	22.666	10.839	-3.809	1.666	-1.686	0.585	2770.6	15.572	1.000	300.0
757- 2- 3	15503.1	2818.6	-528.7	22.601	11.172	-6.059	1.666	-1.686	0.585	2769.2	16.027	1.000	300.0
757- 2- 4	15094.0	2706.7	-539.8	22.434	10.672	-6.309	1.666	-1.686	0.585	2733.3	16.296	1.000	300.0
757- 2- 5	12884.3	2239.8	-250.8	20.436	8.672	-2.309	1.666	-1.686	0.585	2307.7	11.728	1.000	300.0
757- 2- 6	12634.7	1984.3	-572.0	19.715	7.948	-3.972	1.666	-1.686	0.585	2194.1	11.431	1.000	300.0
758- 1- 1	16471.7	2477.6	-365.6	22.936	13.922	-6.142	1.656	-1.696	0.515	2791.4	17.712	1.000	300.0
758- 1- 2	16176.2	2766.0	-371.0	22.655	13.839	-3.930	1.666	-1.686	0.599	2751.9	17.921	1.000	300.0
758- 1- 3	15147.6	[illegible]	-507.1	22.601	11.172	-6.059	1.666	-1.686	0.599	2765.5	16.309	1.000	300.0
758- 1- 4	16072.1	2733.2	-530.4	22.636	13.772	-6.399	1.666	-1.686	0.585	2723.4	16.719	1.000	300.0
758- 1- 5	14120.5	[illegible]	-706.6	23.436	9.672	-6.116	1.666	-1.686	0.515	2377.9	12.759	1.000	300.0
758- 1- 6	15671.7	2764.8	[illegible]	20.606	9.207	-5.116	1.666	-1.686	0.585	2626.1	14.617	1.000	300.0
758- 1- 7	15512.2	2276.7	-756.9	20.576	8.616	-5.223	1.666	-1.686	0.585	2611.5	14.530	1.000	300.0
758- 1- 8	15517.6	2219.2	-747.6	20.676	9.001	-5.148	1.666	-1.685	0.535	2592.5	14.455	1.000	300.0
758- 2- 1	11625.3	2256.8	-712.5	20.543	10.402	-5.949	1.897	-2.062	1.888	2344.4	10.524	1.000	300.0
758- 2- 2	10780.0	2092.2	-643.6	20.691	10.319	-5.216	1.877	-2.062	1.888	2262.8	5.838	1.000	315.0
758- 2- 3	10031.5	1963.6	-689.9	20.610	10.652	-5.466	1.897	-2.062	1.858	2169.0	9.547	1.000	300.0
758- 2- 4	10310.6	1989.8	-723.7	20.443	10.192	-5.716	1.897	-2.062	1.888	2190.2	9.670	1.000	315.0
758- 2- 5	7352.6	1035.9	-666.6	18.781	8.152	-6.645	1.897	-2.062	1.888	1669.0	7.267	1.000	315.0
758- 2- 6	15273.8	1722.7	-1281.9	19.034	5.704	-9.230	1.877	-2.062	1.898	2219.0	12.757	1.000	300.0
758- 2- 7	15749.5	2158.5	-829.7	20.472	7.209	-7.200	1.897	-2.062	1.888	2441.1	13.726	1.000	300.0
758- 2- 8	15550.9	2249.8	-748.6	20.675	7.591	-6.772	1.897	-2.062	1.888	2472.8	13.572	1.000	300.0
758- 2- 9	15539.4	2227.3	-745.2	20.602	7.480	-6.783	1.897	-2.062	1.888	2459.7	13.507	1.000	300.0
758- 2-10	15511.5	2212.3	-746.3	20.543	7.396	-6.773	1.897	-2.062	1.883	2449.9	13.443	1.000	300.0
759- 1- 1	15567.3	2219.4	-675.4	20.570	6.250	-4.999	1.666	-1.686	0.585	2485.4	14.879	1.000	300.0
759- 1- 2	15031.1	2218.7	-656.7	20.720	7.167	-4.666	1.666	-1.686	0.585	2455.5	13.953	1.000	300.0
759- 1- 3	14512.3	2234.6	-742.5	20.637	8.500	-4.916	1.666	-1.686	0.585	2425.9	13.455	1.000	300.0
759- 1- 4	14880.6	2161.5	-771.4	20.473	8.000	-5.166	1.666	-1.686	0.585	2405.0	13.103	1.000	300.0
759- 1- 5	16806.9	1966.3	-682.8	21.682	8.189	-6.059	1.666	-1.686	0.585	2539.4	17.989	1.000	300.0
759- 1- 6	16807.9	1998.0	-690.7	21.533	8.536	-6.151	1.666	-1.686	0.585	2577.2	18.330	1.000	300.0
759- 1- 7	15151.4	1999.2	-459.7	19.933	6.536	-4.151	1.666	-1.686	0.585	2304.9	13.393	1.000	300.0
759- 1- 8	16807.9	1998.0	-690.7	21.933	8.536	-6.151	1.666	-1.686	0.585	2577.2	18.330	1.000	300.0
759- 1- 9	16440.3	1837.0	-840.0	23.933	10.536	-8.151	1.666	-1.686	0.585	2760.9	22.169	1.000	300.0
759- 1-10	16379.2	1706.6	-1113.2	25.533	12.536	-10.151	1.666	-1.686	0.585	3014.3	26.089	1.000	300.0
759- 1-11	16440.3	1837.0	-840.0	23.533	10.536	-8.151	1.666	-1.686	0.585	2760.9	22.169	1.000	300.0
759- 1-12	16379.2	1706.6	-1113.2	25.933	12.536	-10.151	1.666	-1.686	0.585	3014.3	26.089	1.000	300.0
759- 1-13	16440.3	1837.0	-840.0	23.933	13.536	-8.151	1.666	-1.686	0.585	2760.9	22.169	1.000	300.0
759- 1-14	16379.2	1706.6	-1113.2	25.933	12.536	-10.151	1.666	-1.686	0.585	3014.3	26.080	1.000	300.0
759- 1-15	16440.3	1837.0	-840.0	23.933	10.536	-8.151	1.666	-1.686	0.585	2760.9	22.169	1.000	300.0
759- 2- 1	16942.6	1953.3	-544.6	22.430	8.790	-5.993	1.666	-1.686	0.585	2622.5	19.278	1.000	300.0
759- 2- 2	16834.1	2046.7	-535.0	22.180	8.707	-5.650	1.666	-1.686	0.585	2637.7	18.592	1.000	300.0
759- 2- 3	16948.7	2141.3	-685.2	22.077	9.040	-5.700	1.666	-1.686	0.555	2620.8	18.014	1.000	300.0
759- 2- 4	16777.6	1999.1	-691.3	21.910	8.540	-6.150	1.666	-1.686	0.545	2575.9	18.308	1.000	300.0
759- 2- 5	16992.1	1839.6	-842.2	23.930	10.540	-8.150	1.666	-1.686	0.585	2761.7	22.156	1.000	300.0
759- 2- 6	16799.6	1999.1	-691.3	21.930	8.540	-6.150	1.666	-1.686	0.585	2575.9	18.308	1.000	300.0
759- 2- 7	16700.9	2355.1	-12.8	23.530	10.540	-4.150	1.666	-1.686	0.585	2819.2	20.063	1.000	300.0
759- 2- 8	16892.8	1961.1	-575.1	22.140	8.540	-4.940	1.666	-1.686	0.585	2588.4	18.759	1.000	300.0
759- 2- 9	12603.3	2453.4	-892.8	21.488	11.375	-4.768	1.666	-1.686	0.585	2481.1	12.526	1.000	300.0
759- 2-10	4467.9	588.5	-231.9	19.119	10.424	-2.057	1.666	-1.686	0.585	1414.7	6.635	1.000	300.0
759- 2-11	15741.3	2337.8	-231.8	21.119	7.957	-3.254	1.666	-1.686	0.585	2502.2	14.664	1.000	300.0
759- 2-12	16557.0	2315.5	-545.6	22.491	9.655	-5.254	1.666	-1.686	0.585	2690.8	17.985	1.000	300.0
759- 2-13	16358.1	2607.8	-607.2	23.274	11.221	-5.254	1.666	-1.686	0.585	2845.7	18.259	1.000	300.0
759- 2-14	15960.5	2157.0	-1244.6	21.276	9.052	-7.403	1.666	-1.686	0.585	2544.1	18.271	1.000	300.0
759- 2-15	16663.5	2091.4	-1022.1	22.323	9.669	-7.300	1.666	-1.686	0.585	2664.0	18.768	1.000	300.0

TABLE XXIV. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION. V = 0.0

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE #	FC	FX	FY	A0S	B1S	A1S	D0S	D1S	D1C	HP	ALFA	RAD	AZM
760-A1- 1	10637.9	169.1	149.1	18.203	0.650	1.167	6.000	0.0	0.0	1061.4	6.155	0.400	165.0
760-A1- 2	[illegible]	152.1	186.6	17.950	0.567	1.550	6.000	0.0	0.0	961.6	5.972	0.400	165.0
760-A1- 3	[illegible]	182.9	131.9	17.667	0.900	1.250	6.000	0.0	0.0	757.1	5.076	0.400	190.0
760-A1- 4	8855.3	96.2	113.6	17.700	0.400	1.000	6.000	0.0	0.0	910.8	5.632	0.400	155.0
760-A1- 5	11145.9	-51.4	-20.4	18.332	-0.239	-0.207	6.000	0.0	0.0	1077.2	6.084	0.401	165.0
760-A1- 6	11578.0	11.0	6.5	18.434	0.047	0.053	6.000	0.0	0.0	1102.7	6.115	0.400	225.0
760-A2- 1	7553.9	19.6	41.4	21.500	0.050	0.167	9.500	0.0	0.0	856.7	8.096	0.300	155.0
760-A2- 2	6745.3	20.4	71.8	21.250	-0.033	0.700	9.500	0.0	0.0	805.5	7.759	0.300	150.0
760-A2- 3	6670.7	44.1	36.9	21.167	0.300	0.450	9.500	0.0	0.0	784.0	7.809	0.300	195.0
760-A2- 4	5776.9	-12.1	22.7	21.000	-0.200	0.200	9.500	0.0	0.0	737.5	7.563	0.300	120.0
760-A2- 5	12254.8	-0.5	-36.0	22.108	0.050	-0.174	9.500	0.0	0.0	1187.4	9.262	0.300	315.0
760-A2- 6	11524.9	9.3	15.7	22.559	0.033	0.133	9.500	0.0	0.0	1156.7	9.109	0.300	210.0
760-A2- 7	11630.4	17.2	9.9	22.450	0.065	0.085	9.500	0.0	0.0	1110.8	8.965	0.300	180.0
760-A2- 8	11596.8	5.5	9.2	22.497	0.027	0.010	9.500	0.0	0.0	1135.1	9.042	0.300	210.0
760-A3- 1	11091.6	49.4	13.3	9.700	0.250	0.167	-1.000	0.0	0.0	1059.1	2.786	1.000	0.0
760-A3- 2	10244.2	50.5	67.9	9.450	0.167	0.500	-1.000	0.0	0.0	994.4	2.565	1.000	300.0
760-A3- 3	9510.7	86.0	11.5	9.367	0.500	0.250	-1.000	0.0	0.0	972.5	2.403	1.000	0.0
760-A3- 4	9330.0	-2.1	0.2	9.200	0.0	0.0	-1.000	0.0	0.0	979.8	2.272	1.000	0.0
760-A3- 5	11534.4	4.4	10.2	9.816	0.008	0.057	-1.000	0.0	0.0	1091.9	2.881	1.000	0.0
760-A3- 6	11466.9	9.9	9.6	9.838	0.040	0.067	-1.000	0.0	0.0	1088.4	2.872	1.000	0.0
760-A4- 1	6930.5	17.6	37.0	19.500	0.053	0.367	8.000	0.0	0.0	737.4	6.458	0.300	155.0
760-A4- 2	5940.2	14.1	64.7	19.250	-0.033	0.700	8.000	0.0	0.0	733.0	6.318	0.300	130.0
760-A4- 3	5679.9	37.5	31.3	19.167	0.300	0.450	8.000	0.0	0.0	711.1	6.130	0.300	195.0
760-A4- 4	5105.3	-9.2	20.6	19.000	-0.200	0.200	8.000	0.0	0.0	672.1	5.921	0.300	195.0
760-A4- 5	11624.7	-9.8	-32.4	20.722	0.006	-0.194	8.000	0.0	0.0	1086.9	7.646	0.300	330.0
760-A4- 6	11676.8	16.9	[illegible]	20.807	0.072	0.104	8.000	0.0	0.0	1101.3	7.694	0.300	140.0
760-A4- 7	11600.7	-1.7	1.8	20.812	-0.025	0.038	8.000	0.0	0.0	1113.6	7.719	0.300	135.0
760-A4- 8	11673.6	8.7	9.5	20.868	0.030	0.064	8.000	0.0	0.0	1114.3	7.734	0.300	175.0
760-A5- 1	10947.3	48.5	13.2	10.550	0.250	0.167	-0.250	0.0	0.0	1047.0	2.710	0.650	210.0
760-A5- 2	10352.9	49.4	66.2	10.300	0.167	0.500	-0.250	0.0	0.0	989.8	2.497	0.650	165.0
760-A5- 3	9771.2	46.7	13.4	10.217	0.500	0.250	-0.250	0.0	0.0	960.2	2.410	0.650	225.0
760-A5- 4	9144.3	-0.4	0.4	10.050	0.0	0.0	-0.250	0.0	0.0	914.9	2.198	0.650	240.0
760-A5- 5	11411.7	7.8	9.9	10.709	0.037	0.052	-0.250	0.0	0.0	1091.2	2.857	0.650	145.0
760-A5- 6	11445.0	10.4	9.9	10.698	0.046	0.058	-0.250	0.0	0.0	1087.8	2.847	0.650	210.0
760-A6- 1	9853.7	44.6	17.5	14.250	0.250	0.167	3.000	0.0	0.0	971.5	3.612	0.450	210.0
760-A6- 2	9311.4	45.7	60.2	14.000	0.167	0.500	3.000	0.0	0.0	910.6	3.409	0.450	165.0
760-A6- 3	8696.8	74.8	10.1	13.917	0.500	0.250	3.000	0.0	0.0	857.2	3.329	0.450	210.0
760-A6- 4	8123.6	-1.9	0.1	13.750	0.0	0.0	3.000	0.0	0.0	846.8	3.060	0.450	15.0
760-A6- 5	11516.1	-4.1	7.6	14.724	-0.033	0.032	3.000	0.0	0.0	1094.9	4.052	0.450	345.0
760-A6- 6	11493.3	11.5	10.0	14.716	0.046	0.075	3.000	0.0	0.0	1091.7	4.038	0.450	180.0
760-A7- 1	9813.0	44.8	10.9	16.700	0.250	0.167	5.000	0.0	0.0	975.4	4.950	0.400	195.0
760-A7- 2	8956.0	45.3	58.3	16.450	0.167	0.500	5.000	0.0	0.0	914.3	4.758	0.400	165.0
760-A7- 3	8669.5	75.5	9.5	16.367	0.500	0.250	5.000	0.0	0.0	894.4	4.682	0.400	210.0
760-A7- 4	8169.1	1.1	-0.5	16.200	0.0	0.0	5.000	0.0	0.0	857.0	4.418	0.400	345.0
760-A7- 5	11541.1	-3.1	9.9	17.202	-0.037	0.049	5.000	0.0	0.0	1100.5	5.392	0.400	135.0
760-A7- 6	11516.9	13.0	10.1	17.193	0.043	0.078	5.000	0.0	0.0	1098.7	5.392	0.400	160.0
760-A8- 1	12414.8	61.4	16.5	5.500	0.250	0.167	-5.000	0.0	0.0	1213.1	5.279	1.000	165.0
760-A8- 2	12236.1	64.9	75.1	5.250	0.167	0.500	-5.000	0.0	0.0	1167.4	5.057	1.000	165.0
760-A8- 3	[illegible]	105.9	10.9	5.167	0.500	0.250	-5.000	0.0	0.0	1127.4	4.975	1.000	165.0
760-A8- 4	11319.1	1.7	0.1	5.000	0.0	0.0	-5.000	0.0	0.0	1088.3	4.801	1.000	165.0
760-A8- 5	11482.8	9.4	10.1	5.058	0.021	0.062	-5.000	0.0	0.0	1101.9	4.855	1.000	165.0
760-A9- 1	17332.5	78.3	19.6	12.600	0.250	0.167	0.060	0.0	0.0	1522.9	4.496	0.650	210.0
760-A9- 2	16317.0	79.7	106.9	12.350	0.167	0.500	0.060	0.0	0.0	1447.9	4.278	0.650	165.0
760-A9- 3	15728.9	137.4	17.7	12.267	0.500	0.250	0.060	0.0	0.0	1423.5	4.161	0.650	210.0
760-A9- 4	15339.3	-2.8	-0.2	12.100	0.0	0.0	0.060	0.0	0.0	1372.9	3.931	0.650	0.0
760-A9- 5	14312.9	28.9	8.4	11.110	0.102	0.186	0.060	0.0	0.0	1297.9	3.505	0.650	135.0
760-A9- 6	6427.5	6.9	7.9	9.519	0.065	0.093	0.060	0.0	0.0	723.6	1.373	0.650	135.0
760-A9- 7	13137.9	0.6	-7.4	11.519	0.026	-0.028	0.060	0.0	0.0	1207.1	3.322	0.650	0.0
760-A0- 1	-30665.8	-151.6	-88.8	-4.500	0.250	0.167	0.400	0.0	0.0	2502.4	-9.632	1.000	330.0
760-A0- 2	-30627.2	-119.9	-267.4	-4.750	0.167	0.500	0.500	0.0	0.0	2668.6	-9.621	1.000	330.0
760-A0- 3	-30619.4	-295.8	-119.0	-4.833	0.500	0.250	0.600	0.0	0.0	2727.4	-9.620	1.000	0.0
760-A0- 4	-30636.4	2.7	2.1	-5.000	0.0	0.0	0.700	0.0	0.0	2927.3	-9.629	1.000	0.0
760-A0- 5	-30149.0	-916.8	-1246.7	-7.000	2.000	2.000	0.600	1.0	0.0	4205.5	-8.733	1.000	30.0
760-AA- 1	-13339.6	-57.6	-14.1	5.500	0.250	0.167	0.600	0.0	0.0	-591.4	-3.471	0.575	195.0
760-AA- 2	-14278.4	-64.7	-87.8	5.250	0.167	0.500	0.600	0.0	0.0	-668.2	-3.692	0.575	145.0
760-AA- 3	-14625.9	-120.9	-14.5	5.167	0.500	0.250	0.600	0.0	0.0	-664.7	-3.779	0.575	210.0
760-AA- 4	-15231.4	[illegible]	0.2	5.000	0.0	0.0	0.600	0.0	0.0	-621.8	-4.003	0.575	75.0
760-AA- 5	-5250.2	-31.8	-2.9	7.000	0.353	0.201	0.600	0.0	0.0	-80.5	-1.716	0.575	195.0
760-AA- 6	2795.1	35.6	6.2	9.000	0.682	0.336	0.600	0.0	0.0	475.3	0.472	0.575	210.0
760-AA- 7	7155.2	108.3	9.6	10.416	0.873	0.417	0.600	0.0	0.0	772.6	1.423	0.575	210.0
760-AA- 8	6832.2	111.8	12.1	10.322	0.551	0.477	0.600	0.0	0.0	746.1	1.715	0.575	195.0
760-AA- 9	6275.5	73.1	5.4	10.133	0.685	0.292	0.600	0.0	0.0	709.2	1.695	0.575	210.0
760-AA-10	7093.7	138.1	18.3	10.414	1.112	0.593	0.600	0.0	0.0	765.3	1.837	0.575	195.0
760-AA-11	14936.7	975.5	420.9	12.609	1.112	1.009	0.600	0.0	0.0	1361.7	4.598	0.500	180.0
760-AA-12	14213.6	42.8	16.8	12.500	0.250	0.167	0.600	0.0	0.0	1290.8	3.775	0.575	195.0
760-AA-13	13498.0	64.6	87.2	12.250	0.167	0.500	0.600	0.0	0.0	1222.1	3.548	0.575	165.0
760-AA-14	13035.9	111.0	14.7	12.167	0.500	0.250	0.600	0.0	0.0	1209.4	3.474	0.575	210.0
760-AA-15	12633.1	-2.5	0.5	12.000	0.0	0.0	0.600	0.0	0.0	1155.1	3.293	0.575	0.0
760-AA-16	11623.5	11.5	9.7	11.752	0.060	0.073	0.600	0.0	0.0	1087.7	3.003	0.575	210.0

TABLE XXV. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION. V = 120 KTS

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
765-A2- 1	11725.9	1377.5	-28.1	9.126	3.618	0.947	-3.910	2.760	0.120	1252.4	9.942	1.000	255.0
765-A2- 2	10665.2	1260.3	16.4	8.876	3.533	1.180	-3.510	2.760	0.120	1191.4	9.387	1.000	255.0
765-A2- 3	10048.7	1212.5	-40.7	8.793	3.866	0.930	-3.510	2.760	0.120	1168.7	9.078	1.000	255.0
765-A2- 4	10363.6	1186.2	-59.2	8.626	3.366	0.690	-3.510	2.760	0.120	1156.7	9.147	1.000	255.0
765-A2- 5	11533.2	1178.3	40.0	8.618	2.440	0.952	-3.510	2.760	0.120	1171.9	9.658	1.000	255.0
765-A2- 6	11532.6	1188.8	34.6	8.663	2.515	0.939	-3.510	2.760	0.120	1175.9	9.665	1.000	255.0
765-A2- 7	11597.6	1200.4	28.8	8.672	2.596	0.928	-3.510	2.760	0.120	1180.3	9.675	1.000	255.0
765-A3- 1	11088.3	1363.7	-35.8	9.831	4.397	1.724	-2.635	1.861	-0.900	1234.5	9.588	1.000	270.0
765-A3- 2	10661.4	1259.0	9.1	9.581	4.318	2.057	-2.635	1.861	-0.900	1176.0	9.031	1.000	270.0
765-A3- 3	10014.6	1217.9	-48.3	9.498	4.647	1.997	-2.635	1.861	-0.900	1151.6	8.706	1.000	270.0
765-A3- 4	10361.3	1173.1	-65.5	9.331	4.147	1.557	-2.635	1.861	-0.900	1140.0	8.762	1.000	270.0
765-A3- 5	11466.5	1174.1	40.0	9.333	3.254	1.981	-2.635	1.861	-0.900	1156.7	9.272	1.000	270.0
765-A3- 6	11476.3	1195.8	34.3	9.368	3.339	1.988	-2.635	1.861	-0.930	1161.5	9.289	1.000	270.0
765-A3- 7	11517.3	1202.8	29.2	9.410	3.421	1.898	-2.635	1.861	-0.900	1168.6	9.328	1.000	270.0
765-A4- 1	12156.7	1395.2	-7.3	10.572	7.492	2.569	-1.226	-1.389	-2.671	1249.2	9.445	1.000	285.0
765-A4- 2	11106.3	1285.4	39.0	10.322	7.409	2.902	-1.226	-1.389	-2.671	1192.1	8.964	1.000	285.0
765-A4- 3	10512.9	1253.3	-22.4	10.219	7.762	2.452	-1.226	-1.389	-2.671	1171.7	8.651	1.000	285.0
765-A5- 1	9177.8	1121.7	-107.1	15.421	1.402	4.915	1.286	3.692	-2.210	1216.4	11.873	0.300	165.0
765-A5- 2	8136.9	954.8	-67.4	15.171	1.319	5.298	1.286	3.692	-2.210	1144.8	11.558	0.300	165.0
765-A5- 3	7458.6	866.7	-74.8	15.088	1.692	4.998	1.286	3.692	-2.210	1105.1	11.184	0.300	165.0
765-A5- 4	7756.3	855.6	-94.3	14.971	1.152	4.748	1.286	3.692	-2.210	1102.9	11.263	0.300	165.0
765-A5- 5	9753.8	954.4	57.6	14.770	-0.848	5.562	1.286	3.692	-2.210	1165.8	12.467	0.300	165.0
765-A5- 6	11526.2	1177.9	60.1	15.105	-1.106	5.459	1.286	3.692	-2.210	1253.9	13.170	0.300	165.0
765-A5- 7	11454.7	1320.7	-12.8	15.662	0.303	5.363	1.286	3.692	-2.210	1321.7	13.014	0.300	165.0
765-A5- 8	11473.7	1201.8	27.2	15.313	-0.550	5.396	1.286	3.692	-2.210	1279.7	13.098	0.300	165.0
765-A6- 1	9438.9	1169.9	-80.9	13.189	2.472	1.614	0.323	1.888	-0.070	1166.0	6.761	0.300	165.0
765-A6- 2	8395.6	1010.0	-33.8	12.939	2.389	1.947	0.323	1.888	-0.070	1095.7	6.417	0.300	165.0
765-A6- 3	7714.9	936.5	-75.2	12.856	2.722	1.697	0.323	1.888	-0.070	1061.5	6.076	0.300	150.0
765-A6- 4	8012.6	971.9	-90.9	12.689	2.222	1.447	0.323	1.888	-0.070	1059.4	6.153	0.300	150.0
765-A6- 5	11783.5	1061.4	88.2	12.600	-0.592	1.740	0.323	1.888	-0.070	1151.0	8.033	0.300	165.0
765-A6- 6	11915.9	1203.8	32.9	13.046	0.737	1.771	0.323	1.888	-0.070	1205.8	7.846	0.300	165.0
765-A6- 7	11930.7	1200.2	28.0	13.036	0.736	1.743	0.323	1.839	-0.070	1206.3	7.831	0.300	165.0
765-A7- 1	12335.3	1606.0	10.1	9.563	9.059	3.055	-2.212	-2.112	-3.569	1285.6	10.522	1.000	285.0
765-A7- 2	11570.9	1325.2	54.3	9.313	8.576	3.159	-2.212	-2.112	-3.569	1233.3	9.955	1.000	285.0
765-A7- 3	13073.7	1241.1	-12.8	9.230	9.309	3.138	-2.212	-2.112	-3.569	1211.0	9.634	1.000	285.0
765-A7- 4	11617.4	1233.4	-27.8	9.063	8.809	2.348	-2.212	-2.112	-3.569	1195.1	9.120	1.000	285.0
765-A7- 5	11508.9	1149.1	27.6	8.449	8.336	3.053	-2.212	-2.112	-3.569	1180.2	9.769	1.000	235.0
765-A7- 6	11537.0	1198.6	28.5	8.512	8.396	3.136	-2.212	-2.112	-3.569	1183.8	9.772	1.000	235.0
765-A8- 1	14898.9	1645.6	141.4	12.731	5.826	3.294	0.398	-1.636	-2.770	1311.5	10.339	1.000	285.0
765-A8- 2	13833.0	1385.8	187.7	12.481	5.743	3.627	0.398	-1.636	-2.770	1264.9	9.769	1.000	285.0
765-A8- 3	13249.7	1379.5	104.2	12.397	6.076	3.377	0.398	-1.636	-2.770	1252.1	9.472	1.000	285.0
765-A8- 4	13555.9	1300.8	88.1	12.231	5.576	3.127	0.398	-1.636	-2.770	1229.6	9.528	1.000	285.0
765-A8- 5	11576.5	1174.0	39.9	11.748	5.817	3.150	0.398	-1.636	-2.770	1146.4	8.436	1.000	295.0
765-A8- 6	11471.3	1196.0	31.7	11.826	5.967	3.141	0.398	-1.636	-2.770	1153.9	8.449	1.000	235.0
765-A9- 1	15117.5	1619.3	166.0	12.651	6.558	2.562	0.719	-2.759	-2.551	1306.7	9.994	1.000	300.0
765-A9- 2	14136.9	1366.6	206.9	12.401	6.475	2.896	0.719	-2.759	-2.551	1261.5	9.422	1.000	300.0
765-A9- 3	11673.1	1366.6	121.1	12.317	6.808	2.646	0.719	-2.759	-2.551	1250.7	9.144	1.000	300.0
765-A9- 4	13789.6	1282.0	105.9	12.151	6.308	2.396	0.719	-2.759	-2.551	1276.7	9.212	1.000	300.0
765-A9- 5	11659.5	1157.9	40.8	11.672	6.658	2.427	0.719	-2.759	-2.551	1141.2	8.062	1.000	300.0
765-A9- 6	11531.1	1192.2	33.8	11.762	6.872	2.395	0.719	-2.759	-2.551	1154.9	8.104	1.000	300.0
765-A9- 7	11647.9	1199.6	29.1	11.782	6.978	2.396	0.719	-2.759	-2.551	1157.7	8.111	1.000	330.0
765-A0- 1	14758.1	1618.6	165.7	11.931	6.631	2.592	-0.010	-2.289	-2.536	1300.8	10.043	1.000	330.0
765-A0- 2	13731.9	1362.7	190.1	11.681	6.548	2.916	-0.010	-2.289	-2.536	1297.1	9.497	1.000	330.0

TABLE XXV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
765-AA- 1	15375.3	1421.0	151.6	13.371	6.686	2.542	1.449	-3.230	-2.565	1307.4	10.156	0.400	210.0
765-AA- 2	14354.9	1372.6	230.1	13.121	6.601	2.975	1.449	-3.230	-2.565	1265.7	9.354	0.400	210.0
765-AA- 3	13733.3	1379.0	139.2	13.037	6.736	2.625	1.448	-3.230	-2.565	1256.3	9.063	1.000	300.0
765-AA- 4	14032.7	1287.4	124.8	12.871	6.236	2.375	1.448	-3.230	-2.565	1231.0	9.099	1.000	300.0
765-AA- 5	11497.0	1154.1	61.6	12.324	6.579	2.421	1.448	-3.230	-2.565	1138.2	7.838	1.000	300.0
765-AA- 6	11531.6	1149.6	38.7	12.417	6.836	2.353	1.448	-3.230	-2.565	1152.1	7.893	1.000	300.0
765-AA- 7	11432.7	1199.4	28.8	12.465	6.921	2.320	1.448	-3.230	-2.565	1155.9	7.933	1.000	300.0
765-AB- 1	15069.0	1623.5	165.3	12.622	5.975	2.192	0.664	-2.418	-2.018	1301.7	9.618	1.000	300.0
765-AB- 2	13970.5	1363.2	207.3	12.572	5.891	2.435	0.664	-2.418	-2.018	1255.9	9.023	1.000	300.0
765-AB- 3	13372.1	1360.6	121.1	12.289	5.225	2.155	0.664	-2.418	-2.018	1245.4	8.771	1.000	300.0
765-AB- 4	13680.8	1290.0	106.8	12.122	5.725	1.935	0.664	-2.418	-2.018	1221.9	8.829	1.000	300.0
765-AB- 5	11537.0	1165.3	45.5	11.690	6.098	1.955	0.664	-2.418	-2.018	1143.4	7.755	1.000	300.0
765-AB- 6	11441.2	1191.5	32.8	11.761	6.290	1.937	0.664	-2.418	-2.018	1153.2	7.782	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.9	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AB- 7	11538.8	1201.8	29.0	11.785	6.346	1.930	0.664	-2.418	-2.018	1157.3	7.807	1.000	300.0
765-AC- 1	15034.8	1412.7	161.5	12.590	7.145	3.027	0.774	-3.104	-3.097	1305.7	10.293	1.000	300.0
765-AC- 2	14137.6	1365.1	205.3	12.430	7.062	3.360	0.774	-3.104	-3.097	1264.5	9.754	1.000	300.0
765-AC- 3	13533.3	1365.6	120.8	12.346	7.395	3.110	0.774	-3.104	-3.097	1256.0	9.673	1.000	300.0
765-AC- 4	13837.8	1281.9	106.9	12.180	6.895	2.860	0.774	-3.104	-3.097	1230.1	9.593	1.000	300.0
765-AC- 5	11434.5	1151.8	51.7	11.658	7.226	2.893	0.774	-3.104	-3.097	1138.7	8.314	1.000	300.0
765-AC- 6	11533.1	1191.4	34.6	11.767	7.448	2.845	0.774	-3.104	-3.097	1155.3	8.635	1.000	300.0
765-AC- 7	11499.2	1199.7	29.0	11.789	7.510	2.831	0.774	-3.104	-3.097	1158.5	8.414	1.000	300.0
765-AD- 1	15226.7	1390.9	187.7	12.559	7.042	1.635	1.017	-3.739	-2.104	1293.4	9.700	1.000	300.0
765-AD- 2	14222.3	1343.1	228.4	12.309	6.958	1.949	1.017	-3.739	-2.104	1253.4	9.126	1.000	300.0
765-AD- 3	13556.7	1344.3	138.8	12.225	7.292	1.719	1.017	-3.738	-2.106	1244.1	8.848	1.000	300.0
765-AD- 4	13679.6	1259.7	125.8	12.059	6.792	1.469	1.017	-3.738	-2.104	1219.2	8.917	1.000	300.0
765-AD- 5	11451.1	1151.3	51.5	11.591	7.250	1.492	1.017	-3.738	-2.104	1139.9	7.691	1.000	300.0
765-AD- 6	11475.0	1198.3	35.5	11.696	7.690	1.442	1.017	-3.738	-2.104	1154.4	7.752	1.000	300.0
765-AD- 7	11527.6	1201.6	29.1	11.726	7.573	1.446	1.017	-3.738	-2.104	1159.6	7.778	1.000	300.0
765-AE- 1	13399.7	1415.5	80.2	12.638	5.828	3.276	0.456	-1.359	-2.632	1267.7	9.537	1.000	285.0
765-AE- 2	12375.3	1336.9	122.7	12.398	5.745	3.610	0.456	-1.359	-2.632	1218.1	8.977	1.000	235.0
765-AE- 3	11754.1	1314.6	49.7	12.305	6.078	3.360	0.456	-1.359	-2.632	1201.1	8.687	1.000	245.0
765-AE- 4	12060.7	1249.5	35.4	12.138	5.978	3.110	0.456	-1.359	-2.632	1182.1	8.735	1.000	255.0
765-AE- 5	11484.1	1195.8	31.7	11.984	5.564	3.136	0.456	-1.359	-2.632	1152.7	8.417	1.000	285.0
765-AF- 1	13128.2	1388.6	77.2	12.530	6.580	2.530	0.791	-2.378	-2.356	1251.9	8.866	1.000	300.0
765-AF- 2	12350.0	1301.1	118.5	12.280	6.496	2.963	0.791	-2.378	-2.356	1199.8	8.288	1.000	300.0
765-AF- 3	11637.9	1278.5	44.9	12.196	6.030	2.613	0.791	-2.378	-2.356	1183.7	8.013	1.000	300.0
765-AF- 4	11746.8	1215.9	33.0	12.030	6.330	2.363	0.791	-2.378	-2.356	1165.6	8.078	1.000	300.0
765-AF- 5	11432.7	1198.9	30.2	11.981	6.387	2.380	0.791	-2.378	-2.356	1155.3	7.946	1.000	300.0

TABLE XXV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	A1S	B1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
765-AG- 1	13163.0	1388.5	74.9	11.850	6.666	2.558	0.051	-1.976	-2.377	1256.5	9.186	1.000	295.0
765-AG- 2	12115.0	1304.5	117.1	11.590	6.561	2.492	0.051	-1.976	-2.377	1205.4	8.609	1.000	245.0
765-AG- 3	11572.1	1281.1	45.6	11.576	6.596	2.567	0.051	-1.976	-2.377	1187.9	8.299	1.000	295.0
765-AG- 4	11832.5	1219.5	32.8	11.330	6.394	2.392	0.051	-1.976	-2.377	1170.6	8.376	1.000	245.0
765-AG- 5	11534.5	1200.2	29.9	11.269	6.434	2.413	0.051	-1.976	-2.377	1138.6	8.218	1.000	300.0
765-AH- 1	12563.8	1381.6	76.9	13.229	6.519	2.591	1.531	-2.781	-2.336	1246.5	8.491	1.000	310.0
765-AH- 2	11925.0	1293.8	119.0	12.979	6.432	2.836	1.531	-2.781	-2.336	1192.8	7.928	1.000	300.0
765-AH- 3	11331.6	1274.0	46.5	12.496	6.765	2.596	1.531	-2.781	-2.336	1178.1	7.696	1.000	300.0
765-AH- 4	11606.8	1210.3	34.5	12.729	6.265	2.336	1.531	-2.781	-2.336	1159.0	7.727	1.000	300.0
765-AH- 5	11530.8	1200.0	29.6	12.698	6.269	2.316	1.531	-2.781	-2.336	1153.6	7.673	1.000	300.0
765-AI- 1	13028.1	1383.7	76.6	12.506	6.005	2.765	0.733	-2.039	-1.822	1246.0	8.493	1.000	295.0
765-AI- 2	11949.6	1295.5	115.8	12.256	5.922	2.398	0.733	-2.038	-1.822	1194.0	7.926	1.000	285.0
765-AI- 3	11356.0	1272.9	41.7	12.171	6.255	2.148	0.733	-2.038	-1.922	1178.3	7.650	1.000	300.0
765-AI- 4	11621.4	1209.7	32.0	12.006	5.755	1.998	0.733	-2.038	-1.822	1159.0	7.705	1.000	310.0
765-AI- 5	11521.6	1199.4	26.4	11.976	5.766	1.899	0.733	-2.039	-1.922	1153.8	7.639	1.000	300.0
765-AJ- 1	13169.0	1359.9	78.4	12.555	7.158	2.998	0.850	-2.721	-2.893	1255.6	9.14	1.000	300.0
765-AJ- 2	12137.7	1337.3	122.5	12.305	7.075	3.331	0.850	-2.721	-2.893	1205.0	8.649	1.000	300.0
765-AJ- 3	11539.2	1284.9	49.4	12.222	7.408	3.091	0.850	-2.721	-2.893	1188.7	8.363	1.000	300.0
765-AJ- 4	11829.8	1222.3	36.0	12.055	6.908	2.831	0.850	-2.721	-2.893	1170.9	8.436	1.000	300.0
765-AJ- 5	11635.9	1199.4	30.9	11.985	6.952	2.939	0.850	-2.721	-2.893	1157.0	8.266	1.000	300.0
765-AK- 1	12673.0	1352.5	70.5	12.410	7.087	1.595	1.101	-3.252	-1.853	1231.8	8.266	1.000	300.0
765-AK- 2	11651.9	1263.3	108.8	12.160	7.004	1.918	1.101	-3.252	-1.853	1181.3	7.685	1.000	300.0
765-AK- 3	11020.3	1235.0	38.4	12.077	7.337	1.668	1.101	-3.252	-1.853	1162.0	7.402	1.000	300.0
765-AK- 4	11343.4	1181.9	26.9	11.910	6.837	1.418	1.101	-3.252	-1.853	1148.9	7.498	1.000	300.0
765-AK- 5	11476.5	1197.5	28.2	11.962	6.860	1.418	1.101	-3.252	-1.853	1157.3	7.571	1.000	300.0
765-AL- 1	12939.7	1392.4	75.9	12.479	5.430	1.529	0.674	-1.697	-1.298	1240.7	8.162	1.000	285.0
765-AL- 2	11832.1	1289.0	113.6	12.229	5.346	1.932	0.674	-1.697	-1.298	1187.0	7.590	1.000	285.0
765-AL- 3	11233.9	1262.1	39.4	12.146	5.680	1.682	0.674	-1.697	-1.298	1169.1	7.293	1.000	295.0
765-AL- 4	11433.9	1201.7	29.7	11.979	5.180	1.432	0.674	-1.697	-1.298	1151.2	7.331	1.000	285.0
765-AN- 1	12642.1	1358.3	66.3	12.430	5.056	3.750	0.336	-0.550	-2.698	1234.1	9.395	1.000	295.0
765-AN- 2	11535.4	1267.5	109.6	12.380	4.973	4.183	0.336	-0.550	-2.698	1182.0	8.822	1.000	295.0
765-AN- 3	10774.8	1237.2	42.5	12.297	5.306	3.833	0.336	-0.550	-2.698	1162.7	8.527	1.000	295.0
765-AN- 4	11283.3	1182.1	27.9	12.130	4.806	3.583	0.336	-0.550	-2.698	1146.6	8.592	1.000	285.0
765-AN- 5	11497.9	1199.6	28.3	12.180	4.792	3.565	0.336	-0.550	-2.698	1156.3	8.695	1.000	295.0
765-A3- 1	11610.3	1353.7	-35.8	9.831	4.397	1.724	-2.635	1.861	-0.900	1234.5	9.588	1.000	270.0
765-A3- 2	10653.4	1259.0	9.1	9.581	4.314	2.057	-2.635	1.861	-0.900	1175.0	9.031	1.000	270.0
765-A3- 3	10314.6	1217.9	-48.3	9.498	4.647	1.807	-2.635	1.861	-0.900	1151.6	8.706	1.000	270.0
765-A3- 4	10341.3	1173.1	-65.5	9.331	4.147	1.557	-2.635	1.861	-0.900	1140.0	8.762	1.000	270.0
765-A3- 5	11456.5	1174.1	40.0	9.333	3.256	1.891	-2.635	1.861	-0.900	1155.7	9.272	1.000	270.0
765-A3- 6	11476.3	1185.8	34.3	9.368	3.335	1.868	-2.635	1.861	-0.900	1161.9	9.289	1.000	270.0
765-A3- 7	11517.3	1207.8	29.2	9.410	3.421	1.858	-2.635	1.861	-0.900	1168.6	9.328	1.000	270.0
765-AQ- 1	12696.2	1382.9	81.3	12.466	4.313	0.677	0.578	-1.052	-0.219	1229.8	7.455	1.000	285.0
765-AQ- 2	11620.3	1285.3	115.6	12.216	4.230	1.010	0.578	-1.052	-0.219	1176.3	6.872	1.000	285.0
765-AQ- 3	10938.0	1254.2	40.0	12.133	4.563	0.760	0.578	-1.052	-0.219	1157.0	6.593	1.000	285.0
765-AQ- 4	11272.1	1196.4	31.5	11.966	4.063	0.510	0.578	-1.052	-0.219	1139.8	6.615	1.000	285.0
765-AQ- 5	11530.8	1199.9	27.8	11.972	3.962	0.429	0.578	-1.052	-0.219	1164.5	6.711	1.000	285.0

TABLE XXV - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
765-AR- 1	12220.6	1354.6	61.9	13.914	6.397	2.494	2.315	-3.064	-2.274	1214.9	7.096	1.000	330.0
765-AR- 2	11117.9	1255.9	99.9	13.664	6.314	2.027	2.315	-3.064	-2.274	1164.9	7.206	1.000	330.0
765-AR- 3	10583.9	1222.7	30.8	13.581	6.647	2.577	2.315	-3.064	-2.274	1145.2	7.031	1.000	330.0
765-AR- 4	10466.2	1179.3	20.7	13.414	6.147	2.327	2.315	-3.064	-2.274	1130.0	7.077	1.000	300.0
765-AR- 5	11510.8	1198.0	25.9	13.479	5.919	2.231	2.315	-3.064	-2.274	1159.2	7.374	1.000	300.0
765-AR- 6	11539.8	1201.7	28.9	13.486	5.931	2.255	2.315	-3.064	-2.274	1151.4	7.381	1.000	300.0
765-AS- 1	11881.1	1343.1	53.6	14.614	6.320	2.446	3.064	-3.423	-2.237	1208.3	7.720	0.350	195.0
765-AS- 2	10851.4	1245.3	89.1	14.364	6.237	2.799	3.064	-3.423	-2.237	1155.6	7.103	0.400	195.0
765-AS- 3	10246.2	1212.5	21.3	14.281	6.570	2.549	3.064	-3.423	-2.237	1136.4	6.723	1.000	330.0
765-AS- 4	10536.1	1165.4	11.9	14.114	6.070	2.299	3.064	-3.423	-2.237	1123.0	6.773	1.000	330.0
765-AS- 5	11531.8	1190.0	24.5	14.179	5.831	2.198	3.064	-3.423	-2.237	1146.4	7.371	0.350	195.0
765-AS- 6	11494.1	1200.4	29.6	14.299	5.693	2.197	3.064	-3.423	-2.237	1149.9	7.380	0.350	195.0
765-AT- 1	12320.8	1360.1	62.5	15.320	6.578	2.936	3.773	-4.034	-2.796	1226.6	8.821	0.350	195.0
765-AT- 2	11313.1	1280.0	101.3	15.070	6.495	3.269	3.773	-4.034	-2.736	1180.1	8.119	0.350	195.0
765-AT- 3	10718.9	1255.4	34.0	14.986	6.828	3.019	3.773	-4.034	-2.736	1164.0	7.585	0.350	195.0
765-AT- 4	11071.2	1203.6	21.3	14.820	6.328	2.769	3.773	-4.034	-2.796	1149.2	7.718	0.350	195.0
765-AT- 5	11491.9	1196.0	27.8	14.808	5.997	2.657	3.773	-4.034	-2.796	1153.6	8.099	0.350	195.0
765-AU- 1	12543.8	1373.1	75.9	12.447	3.751	0.162	0.520	-0.754	0.330	1225.9	7.010	1.000	255.0
765-AU- 2	11444.9	1268.3	108.1	12.197	3.668	0.495	0.520	-0.754	0.330	1171.3	6.403	1.000	245.0
765-AU- 3	10814.7	1234.0	32.8	12.113	4.001	0.245	0.520	-0.754	0.330	1151.1	6.124	1.000	255.0
765-AU- 4	11132.9	1180.9	24.7	11.947	3.501	-0.005	0.520	-0.754	0.330	1135.8	6.154	1.000	245.0
765-AU- 5	11457.0	1199.3	27.5	11.985	3.374	-0.090	0.520	-0.754	0.330	1147.5	6.331	1.000	255.0
765-AV- 1	12152.4	1344.0	64.3	12.433	3.195	-0.316	0.464	-0.436	0.833	1219.2	6.410	1.000	285.0
765-AV- 2	11332.1	1234.0	94.2	12.183	3.113	0.014	0.464	-0.436	0.833	1163.9	5.761	1.000	255.0
765-AV- 3	10386.1	1193.2	23.0	12.100	3.446	-0.232	0.464	-0.436	0.833	1141.7	5.594	1.000	285.0
765-AV- 4	10632.6	1145.4	14.5	11.933	2.946	-0.482	0.464	-0.436	0.833	1120.2	5.534	1.000	285.0
765-AV- 5	11535.5	1195.8	26.1	12.041	2.739	-0.578	0.464	-0.436	0.833	1157.1	5.911	1.000	285.0
765-AW- 1	12332.2	1340.1	60.3	13.145	3.644	0.155	1.251	-1.107	0.307	1215.1	6.271	1.000	285.0
765-AW- 2	11956.3	1274.4	91.1	12.895	3.560	0.488	1.251	-1.107	0.307	1157.7	5.645	1.000	285.0
765-AW- 3	102[illegible]9.2	1181.4	19.6	12.812	3.894	0.238	1.251	-1.107	0.307	1134.6	5.350	1.000	285.0
765-AW- 4	10591.3	1136.1	12.1	12.645	3.394	-0.012	1.251	-1.107	0.307	1122.0	5.401	1.000	330.0
765-AW- 5	113[illegible]7.4	1195.5	24.8	12.764	3.168	-0.108	1.251	-1.107	0.307	1155.5	5.833	1.000	285.0
765-AW- 6	11497.5	1200.1	29.4	12.779	3.193	-0.073	1.251	-1.107	0.307	1157.0	5.834	1.000	285.0

TABLE XXVI. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION. V = 180 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS					ALFA MAX	
CASE NO	FZ	FX	FY	A0S	A1S	B1S	D0S	D1S	D1C	HP	ALFA	RAD	AZM
770-A1- 1	3612.8	-635.1	-865.7	35.450	17.091	-10.706	5.000	5.000	5.000	2339.1	9.118	0.300	195.0
770-A2- 1	3365.6	2566.5	-1309.8	24.709	21.113	-7.795	-1.000	-1.000	-1.000	3204.9	17.615	1.000	330.0
770-A2- 2	7615.6	2370.0	-1210.9	26.659	21.030	-7.662	-1.000	-1.000	-1.000	3090.4	16.980	1.000	330.0
770-A2- 3	7170.9	2219.3	-1231.5	24.376	21.363	-7.712	-1.000	-1.000	-1.000	2912.5	16.376	1.000	330.0
770-A2- 4	7624.6	2299.1	-1207.8	24.209	20.863	-7.962	-1.000	-1.000	-1.000	3024.7	16.753	1.000	330.0
770-A2- 5	4253.2	1029.9	-779.8	21.810	18.863	-7.049	-1.000	-1.000	-1.000	2183.4	12.619	1.000	330.0
770-A2- 6	10422.2	2570.8	-1619.0	21.810	18.636	-9.569	-1.000	-1.000	-1.000	3277.3	19.468	1.000	330.0
770-A2- 7	11574.0	2839.2	-1331.7	24.206	18.129	-7.000	-1.000	-1.000	-1.000	3379.8	20.932	1.000	295.0
770-A2- 8	11651.9	2823.1	-1309.5	24.382	18.572	-7.852	-1.000	-1.000	-1.000	3411.6	21.013	1.000	295.0
770-A2- 9	11652.9	2893.1	-1303.3	26.737	19.056	-7.921	-1.000	-1.000	-1.000	3471.8	21.312	1.000	295.0
770-A2-10	11678.2	2979.3	-1311.9	24.681	18.963	-7.393	-1.000	-1.000	-1.000	3463.9	21.324	1.000	295.0
770-A3- 1	8263.6	2616.9	-1330.5	22.340	16.475	-12.192	-5.000	5.000	5.000	3339.6	13.524	1.000	260.0
770-A3- 2	7673.2	2629.6	-1232.6	22.090	16.412	-11.969	-5.000	5.000	5.000	3209.2	13.289	1.000	260.0
770-A3- 3	705[illegible]	2748.3	-1222.6	22.007	16.765	-12.099	-5.000	5.000	5.000	3096.8	13.098	1.000	260.0
770-A3- 4	7631.1	2319.6	-1287.9	21.360	16.265	-12.169	-5.000	5.000	5.000	3134.6	13.112	1.000	260.0
770-A3- 5	3221.3	558.5	-357.5	18.355	16.265	-11.036	-5.000	5.000	5.000	2060.9	10.024	1.000	225.0
770-A3- 6	10333.6	2725.2	-1563.7	21.355	13.169	-13.036	-5.000	5.000	5.000	3459.9	13.772	1.000	225.0
770-A3- 7	11378.2	2868.2	-1142.9	21.556	12.576	-11.110	-5.000	5.000	5.000	3555.4	14.117	1.000	225.0
770-A3- 8	11679.5	2836.6	-1305.6	21.512	12.673	-12.037	-5.000	5.000	5.000	3538.3	14.095	1.000	225.0
770-A3- 9	11221.6	3274.1	-1389.5	23.233	15.424	-12.491	-5.000	5.000	5.000	3829.3	15.058	1.000	330.0
770-A3-10	11680.1	2877.1	-1316.1	21.712	12.912	-12.106	-5.000	5.000	5.000	3571.5	14.135	1.000	225.0
770-A3-10	11680.1	2877.1	-1316.1	21.712	12.912	-12.106	-5.000	5.000	5.000	3571.5	14.135	1.000	225.0
770-A3-**	-49.3	-1957.3	586.2	0.0	0.0	0.0	-5.000	5.000	5.000	1132.6	20.551	0.400	210.0
770-A4- 1	7253.3	2150.8	-1613.8	29.176	19.526	-11.780	5.000	-5.000	5.000	3006.3	11.366	1.000	315.0
770-A5- 1	3636.7	-166.6	17.4	33.000	14.850	1.967	5.000	5.000	-5.000	2212.0	16.171	0.300	165.0
770-A5- 2	2661.0	-553.3	176.6	32.750	14.767	2.330	5.000	5.000	-5.000	1998.9	13.712	0.300	150.0
770-A5- 3	2156.8	-879.1	259.8	32.667	15.100	2.050	5.000	5.000	-5.000	1829.8	13.279	0.300	150.0
770-A5- 4	2622.2	-651.1	187.3	32.500	16.600	1.990	5.000	5.000	-5.000	1922.2	13.497	0.300	150.0
770-A5- 5	1172.1	-1615.9	367.3	30.500	12.600	-0.255	5.000	5.000	-5.000	1456.4	11.911	0.300	150.0
770-A5- 6	-89.3	-1957.3	586.2	28.500	10.600	-2.255	5.000	5.000	-5.000	1132.6	10.457	0.300	150.0
770-A5- 7	1172.1	-1616.0	367.3	30.500	12.600	-0.255	5.000	5.000	-5.000	1456.4	11.911	0.300	150.0
770-A5- 8	-59.3	-1957.3	586.2	28.500	10.600	-2.255	5.000	5.000	-5.000	1132.6	10.457	0.300	150.0
770-A6- 1	7665.3	2376.3	-1308.5	31.275	21.088	-4.318	2.000	2.000	-4.000	3327.9	19.857	1.000	295.0
770-A6- 2	7219.0	2190.6	-1200.8	31.025	21.005	-3.935	2.000	2.000	-4.000	3186.9	19.226	1.000	295.0
770-A6- 3	6735.1	2007.2	-1162.1	30.742	21.130	-4.215	2.000	2.000	-4.000	3074.4	18.815	1.000	295.0
770-A6- 4	7091.5	2076.9	-1236.8	30.775	20.838	-4.685	2.000	2.000	-4.000	[illegible]14.1	19.009	1.000	295.0
770-A6- 5	5018.1	1137.0	-702.6	28.979	18.638	-2.499	2.000	2.000	-4.000	2669.4	16.095	1.000	295.0
770-A6- 6	10173.1	2571.6	-1074.0	29.805	16.839	-2.035	2.000	2.000	-4.000	3395.1	20.536	1.000	295.0
770-A6- 7	11656.1	2723.1	-1329.1	29.760	16.043	-2.995	2.000	2.000	-4.000	3566.2	21.997	1.000	295.0
770-A6- 8	11595.5	2801.8	-1295.1	30.082	16.563	-2.747	2.000	2.000	-4.000	3617.0	22.070	1.000	295.0
770-A6- 9	11657.3	2890.0	-1331.5	30.567	17.402	-2.966	2.000	2.000	-4.000	3689.8	22.260	1.000	295.0
770-A6-10	11513.9	2885.8	-1329.0	30.482	17.269	-2.890	2.000	2.000	-4.000	3683.1	22.267	1.000	295.0
770-A7- 1	6616.2	1890.6	-1313.8	30.119	18.923	-8.311	2.000	2.000	2.000	2967.1	11.189	1.000	295.0
770-A7- 2	5636.9	1510.8	-1162.5	29.869	18.869	-8.578	2.000	2.000	2.000	2743.9	10.519	1.000	285.0
770-A7- 3	4416.6	1219.6	-1104.6	29.786	19.173	-8.828	2.000	2.000	2.000	2579.5	10.185	1.000	300.0
770-A7- 4	5600.5	1386.9	-1194.2	29.619	18.673	-9.078	2.000	2.000	2.000	2474.5	10.390	1.000	330.0
770-A7- 5	1133.2	-796.6	-300.2	27.619	16.673	-7.078	2.000	2.000	2.000	1457.9	6.933	1.000	330.0
770-A7- 6	6777.0	1561.1	-1062.1	28.056	14.673	-7.426	2.000	2.000	2.000	2727.4	9.743	1.000	285.0
770-A7- 7	2376.6	-402.6	-343.8	26.016	12.673	-5.949	2.000	2.000	2.000	1642.0	6.136	1.000	330.0
770-A7- 8	10456.6	2661.9	-1170.9	28.202	12.954	-6.505	2.000	2.000	2.000	3365.9	11.781	1.000	285.0
770-A7- 9	8333.1	1693.8	-967.4	26.491	10.954	-6.471	2.000	2.000	2.000	2786.5	9.383	1.000	295.0
770-A7-10	10492.6	2310.3	-1402.7	26.891	11.093	-8.298	2.000	2.000	2.000	3178.0	11.132	1.000	285.0
770-A7-11	11638.5	2878.1	-1283.7	28.003	12.262	-7.749	2.000	2.000	2.000	3489.4	12.376	1.000	285.0
770-A7-12	11651.5	2867.6	-1310.6	28.112	12.449	-7.397	2.000	2.000	2.000	3512.8	12.496	1.000	285.0
770-A7-13	11494.9	2880.3	-1317.1	28.124	12.450	-7.428	2.000	2.000	2.000	3521.9	12.543	1.000	285.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	B1S	A1S	SERVO FLAP CONTROLS DOS	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
770-A9- 1	12096.6	3173.4	-1217.3	28.700	13.200	-6.343	1.800	2.300	1.400	3701.1	14.205	1.000	285.0
770-A9- 2	11326.9	2942.5	-1141.9	28.450	13.117	-6.010	1.800	2.300	1.400	3541.3	13.419	1.000	285.0
770-A9- 3	10507.2	2710.9	-1184.3	28.367	13.450	-6.260	1.800	2.300	1.400	3401.4	12.801	1.000	285.0
770-A9- 4	10999.1	2782.8	-1239.7	28.200	12.550	-6.510	1.800	2.300	1.400	3453.8	13.061	1.000	285.0
770-A9- 5	11500.2	2880.9	-1318.9	28.168	12.696	-6.872	1.800	2.300	1.400	3525.0	13.454	1.000	285.0
770-A0- 1	12161.8	2943.3	-1273.1	25.180	19.210	-7.783	-1.300	-0.750	-1.500	3606.9	23.196	1.000	285.0
770-A0- 2	11919.8	2923.8	-1239.4	24.930	19.127	-7.450	-1.300	-0.750	-1.500	3543.0	22.626	1.000	285.0
770-A0- 3	11381.5	2900.7	-1320.8	24.847	19.460	-7.700	-1.300	-0.750	-1.500	3519.9	22.025	1.000	285.0
770-A0- 4	11081.6	2847.4	-1348.7	24.680	18.560	-7.950	-1.300	-0.750	-1.500	3504.8	22.335	1.000	285.0
770-A0- 5	11674.9	2879.9	-1318.0	24.764	19.246	-7.717	-1.300	-0.750	-1.500	3507.8	22.077	1.000	285.0
770-AA- 1	14118.5	3025.7	1875.4	25.216	15.599	-7.642	-4.825	0.364	6.759	4498.7	29.884	1.000	315.0
770-AB- 1	10198.0	2942.0	-1381.9	24.580	15.352	-7.864	-4.579	7.257	0.578	3654.5	17.456	1.000	255.0
770-AB- 2	10902.5	3158.2	-1333.4	24.580	15.352	-7.864	-4.829	7.173	0.511	3803.4	17.583	1.000	255.0
770-AB- 3	10599.1	3055.3	-1375.4	24.580	15.352	-7.864	-4.912	7.507	0.661	3758.2	17.715	1.000	255.0
770-AB- 4	11913.3	3267.6	-1401.5	24.580	15.352	-7.864	-5.079	7.007	0.411	3928.4	18.548	1.000	270.0
770-AB- 5	10671.3	2974.8	-1436.1	24.580	15.352	-7.864	-3.079	5.007	0.436	3566.6	17.380	1.000	270.0
770-AB- 6	8082.0	2170.5	-1206.8	24.580	15.352	-7.864	-1.079	3.007	1.099	2906.6	12.819	1.000	285.0
770-AB- 7	4668.0	848.5	-861.2	24.580	15.352	-7.864	0.834	1.007	1.105	2099.0	9.423	1.000	300.0
770-AB- 8	11034.1	2827.8	-1283.8	24.580	15.352	-7.864	0.138	0.160	0.953	3198.8	15.464	1.000	300.0
770-AB- 9	10717.7	2689.6	-1245.2	24.580	15.352	-7.864	0.936	-1.031	0.913	3074.4	15.262	1.000	300.0
770-AB-10	10100.9	2541.6	-1220.8	24.580	15.352	-7.864	1.261	-1.391	1.001	2970.1	14.439	1.000	300.0
770-AB-11	12118.5	2964.9	-1362.7	24.580	15.352	-7.864	-0.232	0.475	0.421	3342.6	17.725	1.000	285.0
770-AB-12	11510.0	2894.8	-1314.4	24.580	15.352	-7.864	0.013	0.237	0.703	3261.6	16.454	1.000	285.0
770-AB-13	11477.3	2891.2	-1306.7	24.580	15.352	-7.864	0.034	0.210	0.736	3257.0	16.361	1.000	285.0
770-AC- 1	12637.7	3337.2	-1311.6	24.843	16.280	-8.016	-4.332	5.228	0.310	3924.8	19.604	1.000	270.0
770-AC- 2	12352.5	3333.9	-1268.3	24.593	16.197	-7.683	-4.332	5.228	0.310	3876.0	19.328	1.000	270.0
770-AC- 3	11903.4	3310.7	-1336.1	24.509	16.530	-7.933	-4.332	5.228	0.370	3840.5	19.152	1.000	270.0
770-AC- 4	12232.4	3257.5	-1384.0	24.343	16.030	-8.183	-4.332	5.228	0.370	3827.3	19.239	1.000	270.0
770-AC- 5	10818.6	2761.0	-1121.9	22.343	14.030	-6.747	-4.332	5.228	0.310	3328.2	17.573	1.000	270.0
770-AC- 6	11591.0	2937.4	-1307.7	22.871	14.429	-7.739	-4.332	5.228	0.310	3512.7	18.291	1.000	270.0
770-AC- 7	11428.0	2849.1	-1320.8	22.566	14.080	-7.781	-4.332	5.228	0.370	3447.2	18.014	1.000	270.0
770-AC- 8	11537.3	2879.5	-1316.4	22.675	14.190	-7.776	-4.332	5.228	0.310	3466.4	18.154	1.000	270.0
770-AD- 1	12057.8	3303.6	-1277.3	24.263	16.301	-8.258	-5.519	6.341	0.472	3936.6	19.709	1.000	270.0
770-AD- 2	11809.9	3285.5	-1244.2	24.013	16.218	-7.924	-5.519	6.341	0.472	3886.6	19.339	1.000	270.0
770-AD- 3	11432.0	3254.0	-1332.7	23.930	16.551	-8.174	-5.519	6.341	0.472	3861.1	19.040	1.000	270.0
770-AD- 4	11717.1	3210.4	-1361.8	23.763	16.051	-8.424	-5.519	6.341	0.472	3839.0	19.233	1.000	270.0
770-AD- 5	11032.4	2681.7	-1230.7	21.41.	13.164	-7.659	-5.519	6.341	0.472	3353.9	17.696	1.000	270.0
770-AD- 6	11643.5	2903.8	-1354.7	22.327	14.123	-8.199	-5.519	6.341	0.472	3573.1	18.421	1.000	270.0
770-AD- 7	11583.2	2893.3	-1326.5	22.277	14.095	-8.106	-5.519	6.341	0.472	3554.6	18.386	1.000	270.0
770-AD- 8	11525.0	2886.4	-1319.2	22.246	14.082	-8.070	-5.519	6.341	0.472	3545.4	18.348	1.000	270.0
770-AE- 1	13066.5	3368.3	-1301.6	25.423	16.259	-7.775	-3.145	4.116	0.269	3896.8	19.842	1.000	285.0
770-AE- 2	12779.5	3368.3	-1260.4	25.173	16.176	-7.442	-3.145	4.116	0.269	3849.0	19.458	1.000	270.0
770-AE- 3	12244.0	3351.6	-1326.9	25.089	16.509	-7.692	-3.145	4.116	0.269	3807.4	19.247	1.000	270.0
770-AE- 4	12650.0	3296.3	-1371.0	24.923	16.009	-7.942	-3.145	4.116	0.269	3798.5	19.409	1.000	270.0
770-AE- 5	11037.2	2785.1	-1089.1	22.923	14.009	-6.292	-3.145	4.116	0.269	3292.4	17.300	1.000	270.0
770-AE- 6	11803.2	2904.0	-1328.5	23.340	14.498	-7.449	-3.145	4.116	0.269	3418.2	17.983	1.000	270.0
770-AE- 7	11467.3	2870.4	-1315.3	23.241	14.463	-7.370	-3.145	4.116	0.269	3382.9	17.027	1.000	270.0
770-AE- 8	11880.2	2883.7	-1315.7	23.299	14.538	-7.393	-3.145	4.116	0.269	3397.1	17.074	1.000	270.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	BIS	AIS	SERVO FLAP CONTROLS DOS	DIS	DIC	HP	ALFA MAX ALFA	RAU	AZM
770-AF- 1	12707.9	3353.7	-1313.9	24.738	15.691	-8.356	-4.289	5.378	0.939	3934.6	18.767	1.000	270.0
770-AF- 2	12433.1	3336.9	-1268.1	24.488	15.608	-8.023	-4.289	5.378	0.938	3881.1	18.513	1.000	270.0
770-AF- 3	11997.3	3311.2	-1341.1	24.405	15.941	-8.273	-4.289	5.378	0.938	3844.7	18.342	1.000	270.0
770-AF- 4	12325.2	3253.4	-1385.5	24.238	15.441	-8.523	-4.289	5.378	0.938	3831.6	18.435	1.000	270.0
770-AF- 5	10484.2	2533.7	-1178.5	21.617	12.841	-7.470	-4.289	5.378	0.938	3175.7	16.404	1.000	270.0
770-AF- 6	11634.0	2945.7	-1328.3	22.886	14.029	-8.168	-4.289	5.378	0.938	3539.6	17.476	1.000	270.0
770-AF- 7	11511.3	2885.2	-1318.2	22.654	13.757	-8.117	-4.289	5.378	0.938	3488.9	17.327	1.000	270.0
770-AG- 1	12483.6	3323.3	-1314.6	24.948	16.874	-7.676	-4.375	5.077	-0.201	3914.8	20.432	1.000	285.0
770-AG- 2	12219.7	3320.1	-1263.3	24.898	16.790	-7.342	-4.375	5.077	-0.201	3864.8	20.115	1.000	270.0
770-AG- 3	11790.2	3302.3	-1334.5	24.615	17.124	-7.591	-4.375	5.077	-0.201	3836.9	19.926	1.000	270.0
770-AG- 4	12104.9	3247.8	-1378.7	24.448	16.624	-7.841	-4.375	5.077	-0.201	3819.3	20.027	1.000	270.0
770-AG- 5	8693.7	2225.1	-1147.5	21.458	14.626	-7.009	-4.375	5.077	-0.201	2949.8	16.881	1.000	270.0
770-AG- 6	11776.5	3013.8	-1368.2	23.385	15.396	-7.709	-4.375	5.077	-0.201	3596.7	19.446	1.000	270.0
770-AG- 7	11446.6	2871.5	-1312.4	22.365	14.692	-7.418	-4.375	5.077	-0.201	3454.0	18.953	1.000	270.0
770-AG- 8	11533.7	2883.4	-1317.4	22.399	14.728	-7.453	-4.375	5.077	-0.201	3467.0	19.003	1.000	270.0
770-AH- 1	12633.1	3245.3	-1251.6	24.561	16.768	-8.479	-3.567	3.514	0.570	3795.3	20.513	1.000	285.0
770-AH- 2	12506.2	3244.0	-1221.6	24.311	16.625	-8.146	-3.567	3.514	0.570	3738.0	20.092	1.000	285.0
770-AH- 3	12132.3	3219.0	-1306.0	24.228	16.558	-8.396	-3.567	3.514	0.570	3708.6	19.760	1.000	285.0
770-AH- 4	12415.0	3189.0	-1326.3	24.061	16.458	-8.646	-3.567	3.514	0.570	3705.2	19.963	1.000	285.0
770-AH- 5	11283.0	2767.7	-1226.6	22.061	14.458	-7.729	-3.567	3.514	0.570	3265.0	17.856	1.000	270.0
770-AH- 6	11570.8	2888.8	-1337.3	22.596	15.112	-8.277	-3.567	3.514	0.570	3386.3	18.394	1.000	270.0
770-AH- 7	11408.3	2880.6	-1314.0	22.556	15.119	-8.154	-3.567	3.514	0.570	3371.8	18.301	1.000	270.0
770-AI- 1	12688.4	3354.7	-1298.2	24.633	15.100	-8.697	-4.246	5.529	1.507	3928.1	17.998	1.000	270.0
770-AI- 2	12453.8	3326.8	-1267.0	24.383	15.017	-8.363	-4.246	5.529	1.507	3877.2	17.607	1.000	270.0
770-AJ- 1	7659.2	1929.6	-1258.4	26.582	16.218	-7.291	1.890	0.064	0.0	2736.4	12.916	1.000	300.0
770-AJ- 2	6838.3	1661.9	-1121.4	26.332	16.135	-6.958	1.890	0.064	0.0	2568.3	12.195	1.000	300.0
770-AJ- 3	6123.2	1439.5	-1080.2	26.249	16.468	-7.208	1.890	0.064	0.0	2437.7	11.767	1.000	300.0
770-AJ- 4	6059.8	1567.6	-1163.6	26.082	15.968	-7.458	1.890	0.064	0.0	2511.9	12.051	1.000	300.0
770-AJ- 5	6130.2	1223.1	-780.7	25.227	13.968	-5.165	1.890	0.064	0.0	2267.5	10.675	1.000	300.0
770-AJ- 6	12358.1	2869.1	-984.7	26.564	13.081	-4.759	1.890	0.064	0.0	3321.9	16.076	1.000	300.0
770-BB- 1	13132.4	3167.8	-1360.8	31.050	17.650	-2.833	1.500	2.300	-4.200	4013.4	25.331	1.000	285.0
770-BB- 2	12684.3	3132.6	-1276.4	30.800	17.567	-2.500	1.500	2.300	-4.200	3933.3	24.609	1.000	285.0
770-BB- 3	12099.5	3080.9	-1311.1	30.717	17.900	-2.750	1.500	2.300	-4.200	3865.8	23.893	1.000	285.0
770-BB- 4	12484.7	3045.2	-1375.5	30.550	17.400	-3.000	1.500	2.300	-4.200	3869.7	24.244	1.000	285.0
770-BB- 5	11332.9	2774.0	-1313.3	29.770	16.558	-2.877	1.500	2.300	-4.200	3596.5	22.419	1.000	285.0
770-BB- 6	11342.7	2880.1	-1324.4	30.117	17.377	-2.862	1.500	2.300	-4.200	3685.2	22.831	4.000	285.0
770-BC- 1	11943.2	3054.5	-1285.7	24.326	14.505	-6.334	-3.866	5.522	-0.817	3659.7	19.503	1.000	270.0
770-BC- 2	11573.4	2978.1	-1222.0	24.076	14.822	-6.001	-3.866	5.522	-0.817	3575.3	19.173	1.000	270.0
770-BC- 3	11029.3	2905.3	-1262.0	23.993	15.155	-6.251	-3.866	5.522	-0.817	3513.4	18.987	1.000	270.0
770-BC- 4	11376.7	2885.6	-1334.3	23.826	14.655	-6.501	-3.866	5.522	-0.817	3543.1	18.895	1.000	270.0
770-BD- 1	12353.4	3113.7	-1277.6	24.208	15.495	-6.954	-3.356	4.043	-0.552	3630.9	20.005	1.000	270.0
770-BD- 2	11936.5	3065.5	-1232.5	23.958	15.612	-6.621	-3.356	4.043	-0.552	3568.1	19.518	1.000	270.0
770-BD- 3	11442.6	3008.5	-1292.6	23.875	15.945	-6.871	-3.356	4.043	-0.552	3517.5	19.266	1.000	270.0
770-BD- 4	11814.8	2983.5	-1337.4	23.708	15.445	-7.121	-3.356	4.043	-0.552	3516.9	19.409	1.000	270.0
770-BD- 5	11400.6	2845.5	-1289.8	23.174	14.909	-6.880	-3.356	4.043	-0.552	3389.6	18.907	1.000	270.0
770-BD- 6	11535.1	2882.7	-1318.4	23.336	15.128	-7.019	-3.356	4.043	-0.552	3425.2	19.041	1.000	270.0

TABLE XXVI - Continued

CASE ID	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	RPM
770-BA- 1	11940.3	3023.6	-1276.4	23.514	15.629	-6.790	-4.326	4.879	-0.778	3599.1	20.193	1.000	270.0
770-BA- 2	11593.8	2972.9	-1215.8	23.284	15.956	-6.565	-4.326	4.879	-0.778	3523.0	19.832	1.000	270.0
770-BA- 3	11022.2	2908.4	-1268.1	23.201	15.679	-6.815	-4.326	4.879	-0.778	3472.8	19.601	1.000	270.0
770-BA- 4	11409.1	2890.6	-1320.2	23.034	15.379	-7.065	-4.326	4.879	-0.778	3472.9	19.729	1.000	270.0
770-BB- 1	12780.8	3171.6	-1305.7	24.801	15.762	-7.010	-2.385	3.206	-0.326	3647.0	19.839	1.000	285.0
770-BB- 2	12410.0	3139.4	-1256.4	24.833	15.079	-6.677	-2.385	3.206	-0.326	3586.7	19.265	1.000	285.0
770-BB- 3	11838.3	3092.9	-1317.7	24.550	16.012	-6.927	-2.385	3.206	-0.326	3315.5	18.916	1.000	270.0
770-BB- 4	12203.2	3067.2	-1352.7	24.183	15.512	-7.177	-2.385	3.206	-0.326	3560.2	19.075	1.000	285.0
770-BB- 5	11332.2	2735.2	-1291.5	23.179	14.282	-6.879	-2.385	3.206	-0.326	3254.8	17.754	1.000	270.0
770-BB- 6	11574.8	2847.8	-1328.0	23.755	15.072	-6.970	-2.385	3.206	-0.326	3368.8	18.241	1.000	270.0
770-BB- 7	11472.0	2877.2	-1314.0	23.747	15.113	-6.912	-2.385	3.206	-0.326	3358.2	18.201	1.000	270.0
770-BC- 1	12407.7	3123.9	-1265.6	24.060	15.063	-7.333	-3.301	4.184	0.103	3696.8	18.939	1.000	270.0
770-BC- 2	12130.2	3068.8	-1249.8	23.810	14.980	-7.000	-3.301	4.184	0.103	3552.7	18.726	1.000	270.0
770-BC- 3	11582.7	3011.3	-1301.5	23.727	15.313	-7.250	-3.301	4.184	0.103	3494.1	18.481	1.000	270.0
770-BC- 4	11833.9	2998.3	-1337.6	23.960	14.813	-7.500	-3.301	4.184	0.103	3521.8	18.500	1.000	270.0
770-BC- 5	11300.1	2845.6	-1290.5	23.131	14.534	-7.216	-3.301	4.184	0.103	3365.0	18.045	1.000	270.0
770-BC- 6	11553.5	2881.8	-1325.3	23.220	14.609	-7.377	-3.301	4.184	0.103	3403.4	18.222	1.000	270.0
770-BD- 1	12225.4	3082.7	-1263.4	24.358	16.332	-6.572	-3.411	3.900	-1.211	3627.7	20.873	1.000	270.0
770-BD- 2	11838.6	3045.5	-1227.4	24.108	16.249	-6.219	-3.411	3.900	-1.211	3560.3	20.462	1.000	270.0
770-BD- 3	11298.2	2987.1	-1287.4	24.025	16.502	-6.489	-3.411	3.900	-1.211	3517.3	20.042	1.000	270.0
770-BE- 1	13070.7	3429.5	-1303.2	26.689	14.734	-8.036	0.509	1.105	1.695	3716.4	16.204	1.000	300.0
770-BE- 2	12940.2	3319.7	-1254.1	26.439	14.451	-7.703	0.509	1.105	1.695	3633.1	15.378	1.000	300.0
770-BE- 3	11759.0	3178.1	-1317.0	26.356	14.584	-7.953	0.509	1.105	1.695	3537.3	14.803	1.000	300.0
770-BE- 4	12137.4	3194.4	-1363.3	26.189	14.484	-8.203	0.509	1.105	1.695	3561.5	15.126	1.000	300.0
770-BE- 5	11139.8	2728.3	-1255.7	24.599	13.040	-7.742	0.509	1.105	1.695	3271.5	13.256	1.000	300.0
770-BE- 6	11594.4	2896.4	-1320.4	25.437	13.844	-8.009	0.509	1.105	1.695	3343.3	13.925	1.000	300.0
770-BE- 7	11493.2	2879.1	-1318.1	25.405	13.611	-7.997	0.509	1.105	1.695	3331.2	13.862	1.000	300.0
770-BF- 1	12572.6	3248.1	-1310.7	26.655	14.079	-7.247	0.503	1.732	1.178	3619.3	15.789	1.000	285.0
770-BF- 2	11930.6	3089.1	-1245.1	26.405	13.996	-6.914	0.503	1.732	1.178	3513.0	14.976	1.000	285.0
770-BF- 3	[illegible]	[illegible]	-1276.9	26.322	14.329	-7.164	0.503	1.732	1.178	3409.1	14.390	1.000	285.0
770-BF- 4	[illegible]	[illegible]	-1345.9	26.155	13.829	-7.414	0.503	1.732	1.178	3444.4	14.640	1.000	285.0
770-BF- 5	[illegible]	[illegible]	-1295.2	26.322	14.329	-7.164	0.503	1.732	1.178	3409.0	14.376	1.000	285.0
770-BF- 6	11637.9	2966.2	-1345.2	26.155	13.828	-7.414	0.503	1.732	1.178	3443.3	14.675	1.000	285.0
770-BF- 7	11478.1	2864.5	-1310.0	25.884	13.459	-7.275	0.503	1.732	1.178	3367.5	14.312	1.000	285.0
770-BF- 8	11304.2	2883.5	-1310.1	25.937	13.541	-7.337	0.503	1.732	1.178	3381.3	14.378	1.000	285.0
770-BG- 1	12839.9	3299.7	-1299.5	26.600	14.622	-7.678	0.815	0.770	1.361	3631.6	16.125	1.000	300.0
770-BG- 2	12177.3	3176.8	-1245.5	26.350	14.535	-7.345	0.815	0.770	1.361	3521.6	15.298	1.000	300.0
770-BG- 3	11933.4	3031.7	-1302.0	26.267	14.872	-7.595	0.815	0.770	1.361	3424.1	14.701	1.000	300.0
770-BG- 4	11921.8	3251.2	-1344.4	26.100	14.372	-7.845	0.815	0.770	1.361	3450.6	15.043	1.000	300.0
770-BG- 5	11454.9	2833.2	-1297.6	25.910	13.646	-7.621	0.815	0.770	1.361	3288.6	14.099	1.000	300.0
770-BG- 6	11492.2	2879.7	-1316.7	25.684	13.918	-7.709	0.815	0.770	1.361	3325.3	14.296	1.000	300.0
770-BH- 1	12820.5	3293.3	-1267.3	26.500	16.989	-8.200	1.152	-0.164	1.709	3590.2	16.499	1.000	300.0
770-BH- 2	12290.3	3186.8	-1225.7	26.250	14.506	-7.867	1.152	-0.164	1.709	3491.1	15.616	1.000	300.0
770-BH- 3	11530.7	3057.4	-1295.5	26.167	15.239	-8.117	1.152	-0.164	1.709	3401.5	14.913	1.000	300.0
770-BH- 4	12000.2	3071.9	-1331.6	26.000	16.735	-8.367	1.152	-0.164	1.709	3424.9	15.296	1.000	300.0
770-BH- 5	11330.5	2800.9	-1289.0	25.309	13.947	-8.157	1.152	-0.164	1.709	3228.6	14.070	1.000	300.0
770-BH- 6	11490.5	2870.8	-1310.2	25.544	14.265	-8.249	1.152	-0.164	1.709	3287.2	14.426	1.000	300.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
770-BI- 1	12696.0	3239.0	-1298.0	27.285	14.692	-7.695	1.000	-0.087	1.535	3584.3	15.978	1.000	300.0
770-BI- 2	11625.1	3007.0	-1262.3	27.035	14.555	-7.362	1.000	-0.087	1.535	3463.3	14.663	1.000	300.0
770-BI- 3	11064.6	2919.7	-1295.0	26.952	14.932	-7.612	1.000	-0.087	1.535	3354.0	14.023	1.000	300.0
770-BI- 4	11553.6	2960.1	-1343.5	26.785	14.432	-7.862	1.000	-0.087	1.535	3392.0	14.389	1.000	300.0
770-BI- 5	11425.3	2859.2	-1300.6	26.405	13.824	-7.696	1.000	-0.087	1.535	3307.0	13.920	1.000	300.0
770-BI- 6	11699.2	2879.5	-1317.5	26.521	13.995	-7.766	1.000	-0.087	1.535	3336.6	14.099	1.000	300.0
770-BJ- 1	7061.5	1700.2	-1051.3	23.915	14.562	-7.661	-0.171	1.627	1.186	2555.7	11.036	1.000	285.0
770-BJ- 2	6210.7	1412.2	-916.9	23.665	14.679	-7.120	-0.171	1.627	1.186	2300.7	10.270	1.000	285.0
770-BJ- 3	5509.6	1184.9	-872.2	23.582	14.812	-7.578	-0.171	1.627	1.186	2269.0	9.819	1.000	285.0
770-BJ- 4	6061.9	1322.2	-952.5	23.415	14.312	-7.028	-0.171	1.627	1.186	2326.8	10.064	1.000	285.0
770-BJ- 5	1347.0	-526.4	-168.9	21.415	12.312	-5.028	-0.171	1.627	1.186	1310.9	6.149	1.000	300.0
770-BJ- 6	-6376.3	-2902.5	556.2	19.415	10.312	-3.028	-0.171	1.627	1.186	258.5	2.681	1.000	315.0
770-BJ- 7	-8765.0	-4049.7	833.4	17.977	8.312	-1.028	-0.171	1.627	1.186	-365.3	0.618	0.400	105.0
770-BJ- 8	3033.5	55.4	74.3	19.993	6.312	0.172	-0.171	1.627	1.186	1653.0	5.805	1.000	270.0
770-BJ- 9	-2769.8	-2210.9	100.1	17.993	4.312	2.172	-0.171	1.627	1.186	652.0	3.049	0.300	120.0
770-BJ-10	-10150.6	-5000.3	-197.0	15.593	2.312	4.172	-0.171	1.627	1.186	-165.4	2.850	0.300	105.0
770-BJ-11	6351.2	325.0	902.4	17.993	0.312	6.172	-0.171	1.627	1.186	1062.1	7.202	1.000	255.0
770-BJ-12	3219.7	-571.4	616.0	15.593	-1.688	6.172	-0.171	1.627	1.136	1421.1	5.213	0.300	120.0
770-BK- 1	12629.7	3218.2	-1279.1	26.440	13.971	-8.011	0.907	0.871	1.970	3575.6	14.769	1.000	300.0
770-BK- 2	11778.5	3060.9	-1221.6	26.190	13.890	-7.678	0.907	0.871	1.970	3452.9	13.918	1.000	300.0
770-BK- 3	11027.0	2886.9	-1276.8	26.107	14.221	-7.928	0.907	0.871	1.970	3332.7	13.287	1.000	300.0
770-BK- 4	11538.7	2937.1	-1326.6	25.940	13.721	-8.178	0.907	0.871	1.970	3381.2	13.639	1.000	300.0
770-BK- 5	11430.8	2849.0	-1308.9	25.669	13.345	-8.126	0.907	0.871	1.970	3321.5	13.339	1.000	300.0
770-BK- 6	11669.6	2877.3	-1316.7	25.763	13.441	-8.163	0.907	0.871	1.970	3341.8	13.450	1.000	300.0
770-BL- 1	13070.2	3332.9	-1306.1	26.760	15.274	-7.345	0.722	0.669	0.751	3667.4	17.628	1.000	285.0
770-BL- 2	12497.2	3233.1	-1266.8	26.910	15.191	-7.012	0.722	0.669	0.751	3567.5	16.779	1.000	285.0
770-BL- 3	11791.8	3121.7	-1324.3	26.427	15.524	-7.262	0.722	0.669	0.751	3481.'	16.049	1.000	300.0
770-BL- 4	12249.6	3123.0	-1367.8	26.260	15.024	-7.512	0.722	0.669	0.751	3500.8	16.406	1.000	300.0
770-BL- 5	11317.9	2800.4	-1269.4	25.416	14.116	-7.049	0.722	0.669	0.751	3248.3	14.860	1.000	330.0
770-BL- 6	11506.1	2801.2	-1318.7	25.664	14.453	-7.270	0.722	0.669	0.751	3316.8	15.275	1.000	300.0
770-BM- 1	12533.8	3156.0	-1209.8	25.392	14.507	-9.154	0.864	-0.878	2.447	3472.6	16.136	1.000	300.0
770-BM- 2	11907.8	3058.4	-1174.3	25.142	14.824	-8.871	0.864	-0.878	2.447	3379.1	15.182	1.000	300.0
770-BM- 3	11204.9	2926.1	-1249.6	25.059	15.157	-9.071	0.864	-0.878	2.447	3288.7	14.446	1.000	300.0
770-BM- 4	11739.1	2944.3	-1280.3	24.892	14.657	-9.321	0.864	-0.878	2.447	3311.7	14.849	1.000	300.0
770-BM- 5	11602.4	2875.1	-1314.3	24.786	14.659	-9.469	0.864	-0.878	2.447	3269.1	14.538	1.000	300.0
770-BN- 1	12839.0	3231.9	-1321.9	26.074	14.464	-6.665	-0.621	2.689	0.237	3675.8	17.748	1.000	285.0
770-BN- 2	12241.5	3114.1	-1255.8	25.824	14.381	-6.332	-0.621	2.689	0.237	3563.9	17.079	1.000	285.0
770-BN- 3	11558.0	3007.3	-1306.2	25.741	14.714	-6.582	-0.621	2.689	0.237	3477.5	16.495	1.000	285.0
770-BN- 4	12022.5	3011.3	-1350.0	25.574	14.214	-6.832	-0.621	2.689	0.237	3498.6	16.811	1.000	285.0
770-BN- 5	11458.8	2863.3	-1307.4	25.259	14.004	-6.626	-0.621	2.689	0.237	3374.9	16.044	1.000	285.0
770-BN- 6	11502.0	2881.8	-1318.4	25.313	14.077	-6.671	-0.621	2.689	0.237	3309.6	16.157	1.000	285.0
770-BO- 1	13161.5	3257.2	-1268.1	25.865	15.579	-7.843	0.187	0.331	0.888	3597.3	18.478	1.000	285.0
770-BO- 2	12757.4	3227.9	-1221.3	25.615	15.496	-7.510	0.187	0.331	0.888	3532.3	17.691	1.000	285.0
770-BO- 3	12101.8	3146.4	-1294.7	25.532	15.829	-7.760	0.187	0.331	0.888	3462.4	17.016	1.000	285.0
770-BO- 4	12566.0	3126.1	-1334.8	25.365	15.329	-8.010	0.187	0.331	0.888	3471.5	17.357	1.000	285.0
770-BO- 5	10068.0	2335.0	-1086.9	23.321	13.248	-6.885	0.187	0.331	0.888	2853.8	13.189	1.000	300.0
770-BO- 6	11368.8	2912.9	-1319.2	24.815	15.045	-7.879	0.187	0.331	0.888	3284.6	15.965	1.000	300.0
770-BO- 7	11696.5	2880.4	-1317.3	24.717	14.932	-7.876	0.187	0.331	0.888	3260.3	15.817	1.000	300.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	DIS	AIS	SERVO FLAP CONTROLS DOS	DIS	DIC	HP	ALFA HAR ALFA	RAD	AZM
770-BP- 1	12722.3	3144.4	-1320.1	25.412	14.930	-6.686	-1.613	3.552	0.097	3676.2	18.033	1.000	270.0
770-BP- 2	12183.6	3062.2	-1247.7	25.162	14.347	-6.353	-1.613	3.552	0.097	3573.3	17.608	1.000	270.0
770-BP- 3	11327.6	2905.5	-1290.5	25.079	14.680	-6.603	-1.613	3.552	0.097	3491.1	17.144	1.000	270.0
770-BP- 4	11982.1	2980.9	-1346.6	24.912	14.180	-6.853	-1.613	3.552	0.097	3511.6	17.375	1.000	270.0
770-BP- 5	11443.7	2854.6	-1308.3	24.626	14.041	-6.734	-1.613	3.552	0.097	3395.5	16.845	1.000	270.0
770-BP- 6	11514.8	2886.7	-1319.8	24.708	14.143	-6.768	-1.613	3.552	0.097	3420.1	16.941	1.000	270.0
770-BU- 1	13123.8	3213.1	-1242.1	25.204	15.546	-7.463	-0.806	1.195	0.748	3607.4	19.066	1.000	285.0
770-BU- 2	12834.1	3223.1	-1229.4	24.954	15.463	-7.530	-0.806	1.195	0.748	3564.9	18.368	1.000	285.0
770-BU- 3	12253.0	3157.8	-1305.3	24.871	15.746	-7.780	-0.806	1.195	0.748	3500.9	17.652	1.000	285.0
770-BU- 4	12673.7	3123.7	-1345.3	24.704	15.296	-8.030	-0.806	1.195	0.748	3507.5	18.201	1.000	285.0
770-BU- 5	9970.8	2373.1	-940.4	22.104	13.296	-6.030	-0.806	1.195	0.748	2862.7	13.790	1.000	285.0
770-BU- 6	11573.8	2921.3	-1302.9	24.137	15.086	-7.746	-0.806	1.195	0.748	3304.5	16.709	1.000	285.0
770-BU- 7	11474.7	2884.0	-1316.1	24.019	14.959	-7.837	-0.806	1.195	0.748	3277.2	16.562	1.000	285.0
770-BR- 1	12710.2	3119.0	-1183.3	24.797	15.649	-9.279	0.022	-0.725	2.070	3486.1	17.920	1.000	300.0
770-BR- 2	12322.3	3096.0	-1163.7	24.547	15.566	-8.946	0.022	-0.725	2.070	3429.6	16.945	1.000	300.0
770-BR- 3	11607.3	3024.0	-1245.4	24.464	15.899	-9.196	0.022	-0.725	2.070	3365.0	16.263	1.000	300.0
770-BR- 4	12114.5	3004.4	-1277.0	24.297	15.399	-9.446	0.022	-0.725	2.070	3373.4	16.669	1.000	300.0
770-BR- 5	11009.6	2691.5	-1236.6	23.387	14.604	-9.131	0.022	-0.725	2.070	3110.9	14.560	1.000	300.0
770-BR- 6	11506.7	2891.5	-1318.0	24.035	15.351	-9.538	0.022	-0.725	2.070	3271.1	15.718	1.000	300.0
770-C1- 1	8166.5	1439.4	137.7	25.898	13.371	0.364	1.609	-0.208	2.511	2468.7	7.517	1.000	300.0
770-C1- 2	4506.3	748.7	98.3	25.648	13.288	0.697	1.609	-0.208	2.511	2126.0	6.789	1.000	300.0
770-C1- 3	2934.8	105.3	18.9	25.565	13.621	0.447	1.609	-0.208	2.511	1809.7	6.140	1.000	300.0
770-C1- 4	3974.0	506.7	33.2	25.398	13.121	0.197	1.609	-0.208	2.511	1996.8	6.504	1.000	300.0
770-C1- 5	-4428.9	-3504.3	-57.2	23.398	11.121	2.197	1.609	-0.208	2.511	220.5	3.417	0.300	105.0
770-C1- 6	-7987.3	-4966.3	188.0	21.206	9.121	0.197	1.609	-0.208	2.511	-120.5	2.831	0.300	105.0
770-C1- 7	-9288.0	-5277.6	504.5	19.206	7.121	-1.803	1.609	-0.208	2.511	-95.4	2.548	0.300	90.0
770-C1- 8	-10187.1	-5328.2	858.3	17.206	5.121	-3.803	1.609	-0.208	2.511	-1.6	2.300	0.300	90.0
770-C1- 9	-10915.3	-5259.7	1255.0	15.206	3.121	-5.803	1.609	-0.208	2.511	101.2	2.016	0.300	90.0
770-C1-10	-11570.6	-5124.7	1672.3	13.206	1.121	-7.803	1.609	-0.208	2.511	399.8	1.694	0.300	75.0
770-C1-11	-12130.1	-4909.9	2113.3	11.206	-0.879	-9.803	1.609	-0.208	2.511	672.5	1.394	0.300	75.0
770-C1-12	-11570.6	-5124.7	1672.3	13.206	1.121	-7.803	1.609	-0.208	2.511	399.8	1.694	0.300	75.0
770-C1-13	-12130.1	-4909.9	2113.3	11.206	-0.879	-9.803	1.609	-0.208	2.511	672.5	1.394	0.300	75.0
770-C1-14	-11570.6	-5124.7	1672.3	13.206	1.121	-7.803	1.609	-0.208	2.511	399.8	1.694	0.300	75.0
770-C1-15	-12130.1	-4939.9	2113.3	11.206	-0.879	-9.803	1.609	-0.208	2.511	672.5	1.394	0.300	75.0
770-C2- 1	4625.8	732.3	122.7	25.836	12.590	0.376	1.519	0.375	3.178	2194.1	6.162	1.000	315.0
770-C2- 2	2700.8	-63.8	75.6	25.556	12.507	0.709	1.519	0.375	3.178	1815.7	5.279	1.000	315.0
770-C2- 3	1262.9	-729.3	-5.7	25.473	12.840	0.459	1.519	0.375	3.178	1500.1	4.913	1.000	315.0
770-C2- 4	2241.1	-350.5	21.7	25.306	12.340	0.209	1.519	0.375	3.178	1694.5	5.177	1.000	315.0
770-C2- 5	-849.6	-1600.5	-13.5	25.463	14.340	-1.791	1.519	0.375	3.178	1038.7	4.601	1.000	315.0
770-C2- 6	-2820.9	-2589.7	170.1	23.463	12.265	-3.791	1.519	0.375	3.178	629.3	3.477	1.000	315.0
770-C2- 7	-4462.2	-3259.5	451.5	21.463	10.265	-5.791	1.519	0.375	3.178	404.6	2.304	1.000	315.0
770-C2- 8	-5805.2	-3686.9	769.2	19.463	8.265	-7.791	1.519	0.375	3.178	327.6	2.060	0.300	90.0
770-C2- 9	-7092.6	-4016.9	1101.2	17.463	6.265	-9.791	1.539	0.375	3.178	320.5	1.913	0.300	75.0
770-C2-10	-8163.3	-4174.9	1634.2	15.463	4.265	-11.791	1.539	0.375	3.178	394.3	1.871	0.300	75.0
770-C2-11	-9105.9	-4251.4	2159.6	13.463	2.265	-13.791	1.539	0.375	3.178	548.2	1.752	0.300	75.0
770-C2-12	-8163.3	-4174.9	1634.2	15.463	4.265	-11.791	1.539	0.375	3.178	394.3	1.871	0.300	75.0
770-C2-13	-9105.9	-4251.4	2159.6	13.463	2.265	-13.791	1.539	0.375	3.178	548.2	1.752	0.300	75.0
770-C2-14	-8163.3	-4174.9	1634.2	15.463	4.265	-11.791	1.539	0.375	3.178	394.3	1.871	0.300	75.0
770-C2-15	-9105.9	-4251.4	2159.6	13.463	2.265	-13.791	1.539	0.375	3.178	548.2	1.752	0.300	75.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	OIS	AIC	SERVO FLAP CONTROLS DOS	DIS	DIC	HP	ALFA MAX ALFA	RAD	AZM
770-C3- 1	6568.5	1670.0	162.8	25.991	14.152	0.351	1.680	-0.791	2.511	2547.4	8.474	1.000	300.0
770-C3- 2	4918.2	930.7	111.9	25.741	14.069	0.686	1.680	-0.791	2.511	2214.8	7.350	1.000	300.0
770-C3- 3	3341.4	371.5	15.7	25.657	14.402	0.434	1.680	-0.791	2.511	1903.7	6.678	1.000	315.0
770-C3- 4	4633.9	775.9	40.3	25.491	13.502	0.164	1.680	-0.791	2.511	2075.4	7.116	1.000	315.0
770-C3- 5	1743.4	-437.6	-95.4	23.491	11.902	-1.815	1.680	-0.791	2.511	1475.2	5.709	1.000	315.0
770-C3- 6	-214.9	-1244.5	-51.9	21.944	10.558	-3.815	1.680	-0.791	2.511	1076.8	4.612	1.000	315.0
770-C4- 1	7253.3	2150.8	-1515.8	29.176	19.526	-11.780	5.000	-5.000	5.000	3006.[illegible]	11.366	1.000	315.0
770-C4- 2	5547.6	1432.0	-1248.8	28.926	19.443	-11.447	5.000	-5.000	5.000	2637.3	10.348	1.000	315.0
770-C4- 3	4842.0	1149.0	-1191.3	28.843	19.776	-11.697	5.000	-5.000	5.000	2480.2	9.548	1.000	315.0
770-C4- 4	5225.2	1264.3	-1247.2	28.676	19.276	-11.947	5.000	-5.000	5.000	2534.1	9.926	1.000	315.0
770-C4- 5	-842.4	-1590.0	-234.7	26.318	17.276	-9.947	5.000	-5.000	5.000	1413.6	5.521	1.000	310.0
770-C4- 6	-5912.3	-3983.1	936.6	23.782	15.276	-11.947	5.000	-5.000	5.000	741.8	2.855	1.000	315.0
770-C4- 7	-1534.6	-1739.3	46.9	23.282	13.750	-13.947	5.000	-5.000	5.000	1371.5	4.918	1.000	310.0
770-D4- 1	5587.7	1187.1	160.8	25.153	12.565	0.351	0.540	1.241	3.041	2402.7	7.430	1.000	270.0
770-D4- 2	3654.4	459.0	128.5	24.903	12.481	0.685	0.540	1.241	3.041	2049.5	6.201	1.000	270.0
770-E1- 1	11370.9	2855.7	-1227.4	25.899	13.371	-8.688	1.563	-0.208	2.845	3310.5	12.727	1.000	315.0
770-E1- 2	10577.2	2638.7	-1150.3	25.649	13.288	-8.355	1.563	-0.208	2.845	3166.6	11.904	1.000	315.0
770-E1- 3	9754.6	2452.9	-1171.7	25.566	13.621	-8.635	1.563	-0.208	2.845	3055.2	11.418	1.000	315.0
770-E1- 4	10310.8	2523.5	-1225.6	25.399	13.121	-8.855	1.563	-0.208	2.845	3101.5	11.724	1.000	315.0
770-E1- 5	11463.[illegible]	2860.4	-1328.7	25.912	13.447	-9.210	1.563	-0.208	2.845	3327.3	12.964	1.000	315.0
770-E1- 6	11526.8	2897.1	-1312.5	25.989	13.525	-9.116	1.563	-0.208	2.845	3348.4	13.051	1.000	315.0
770-E1- 7	[illegible]	2886.4	-1318.4	25.557	13.488	-9.148	1.563	-0.208	2.845	3342.1	13.028	1.000	315.0
770-E2- 1	10842.6	2681.[illegible]	-1182.0	25.807	12.590	-8.676	1.474	0.375	3.178	3240.7	11.519	1.000	315.0
770-E2- 2	10000.1	2446.7	[illegible]	25.557	12.506	-8.343	1.474	0.375	3.178	3091.0	10.786	1.000	315.0
770-E2- 3	9176.0	2218.3	-1115.4	25.473	12.840	-8.591	1.474	0.375	3.178	2956.5	10.357	1.000	315.0
770-E2- 4	9733.8	2317.9	-1166.3	25.307	12.340	-8.843	1.474	0.375	3.178	3021.0	10.655	1.000	315.0
770-E2- 5	11444.2	2805.3	-1314.2	26.166	12.558	-9.228	1.474	0.375	3.178	3380.9	12.289	1.000	315.0
770-E3- 1	11818.4	3000.1	-1255.5	25.992	14.152	-8.701	1.651	-0.791	2.511	3371.9	14.121	1.000	315.0
770-E3- 2	11136.7	2826.7	-1137.3	25.742	14.069	-8.368	1.651	-0.791	2.511	3246.5	13.228	1.000	315.0
770-E3- 3	10368.5	2649.6	-1229.4	25.658	14.402	-8.518	1.651	-0.791	2.511	3138.9	12.652	1.000	315.0
770-E3- 4	10698.8	2694.3	-1270.3	25.492	13.902	-8.968	1.651	-0.791	2.511	3173.5	12.990	1.000	315.0
770-E3- 5	11525.5	2890.8	-1362.5	25.831	14.149	-9.205	1.651	-0.791	2.511	3313.4	13.904	1.000	315.0
770-E3- 6	11545.7	2819.9	-1322.9	25.803	14.096	-9.110	1.651	-0.791	2.511	3304.1	13.832	1.000	315.0
770-E4- 1	11312.9	2816.7	-1209.6	25.154	12.565	-8.701	0.476	1.241	3.041	3318.9	12.104	1.000	300.0
770-E4- 2	10501.9	2601.1	-1117.7	24.904	12.481	-8.367	0.476	1.241	3.041	3174.7	11.327	1.000	300.0
770-E4- 3	9659.8	2307.6	-1137.0	24.821	12.815	-8.617	0.476	1.241	3.041	3047.2	10.841	1.000	300.0
770-E4- 4	10222.1	2470.8	-1192.5	24.654	12.315	-8.867	0.476	1.241	3.041	3102.4	11.133	1.000	300.0
770-E4- 5	11505.7	2903.4	-1324.5	25.377	12.949	-9.223	0.476	1.241	3.041	3386.7	12.510	1.000	300.0
770-E4- 6	11498.9	2880.7	-1319.1	25.298	12.817	-9.213	0.476	1.241	3.041	3371.9	12.439	1.000	300.0
770-F2- 1	11533.5	2909.0	-1241.0	26.008	13.305	-8.310	1.341	0.328	2.516	3351.8	12.968	1.000	300.0
770-F2- 2	10740.6	2687.0	-1164.6	25.758	13.222	-7.977	1.341	0.328	2.516	3206.1	12.111	1.000	300.0
770-F2- 3	9907.3	2491.9	-1184.4	25.675	13.555	-8.227	1.341	0.328	2.516	3090.5	11.598	1.000	300.0
770-F2- 4	10460.1	2562.3	-1244.3	25.508	13.055	-8.477	1.341	0.328	2.516	3138.2	11.865	1.000	300.0
770-F2- 5	11694.5	2872.6	-1333.3	25.968	13.319	-8.765	1.341	0.328	2.516	3343.1	13.020	1.000	300.0
770-F2- 6	11509.7	2888.0	-1315.5	25.979	13.349	-8.676	1.341	0.328	2.516	3349.9	13.028	1.000	300.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	B1S	A1S	SERVO FLAP CONTROLS DOS	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
770-F3- 1	11608.2	2848.1	-1236.5	25.557	13.362	-8.493	1.453	0.046	2.668	3315.0	12.873	1.000	300.0
770-F3- 2	10679.2	2670.2	-1159.7	25.707	13.279	-8.160	1.453	0.046	2.668	3189.5	12.007	1.000	300.0
770-F3- 3	9870.9	2484.6	-1180.6	25.624	13.612	-8.410	1.453	0.046	2.668	3078.7	11.468	1.000	300.0
770-F3- 4	10404.5	2549.8	-1232.3	25.457	13.112	-8.660	1.453	0.046	2.668	3123.2	11.779	1.000	315.0
770-F3- 5	11444.5	2868.1	-1331.2	25.521	13.350	-8.976	1.453	0.046	2.658	3334.4	12.979	1.000	300.0
770-F3- 6	11514.9	2892.8	-1312.3	25.975	13.450	-8.871	1.453	0.046	2.668	3347.7	13.033	1.000	300.0
770-F3- 7	11490.7	2879.1	-1317.6	25.952	13.423	-8.903	1.453	0.046	2.668	3340.3	12.994	1.000	300.0
770-F4- 1	10943.0	2728.5	-1206.9	26.552	13.396	-8.663	2.561	1.075	2.982	3244.6	12.273	1.000	315.0
770-F4- 2	10172.2	2522.6	-1125.6	26.302	13.313	-8.330	2.561	-1.075	2.982	3111.3	11.500	1.000	315.0
770-F4- 3	9371.2	2314.7	-1151.6	26.219	13.646	-8.580	2.561	-1.075	2.982	2991.8	11.032	1.000	315.0
770-F4- 4	9565.2	2394.5	-1198.1	26.052	13.146	-8.830	2.561	-1.075	2.982	3043.0	11.326	1.000	315.0
770-F4- 5	11637.6	2897.3	-1319.7	26.833	13.685	-9.184	2.561	-1.075	2.982	3365.2	13.039	1.000	315.0
770-F4- 6	11499.0	2881.4	-1319.8	26.768	13.573	-9.131	2.561	-1.075	2.982	3355.5	13.012	1.000	315.0
770-F5- 1	11803.4	2981.9	-1239.3	25.247	13.346	-8.713	0.564	0.658	2.708	3388.2	13.416	1.000	300.0
770-F5- 2	11076.4	2790.3	-1170.9	24.997	13.263	-8.380	0.564	0.658	2.708	3253.1	12.557	1.000	300.0
770- J- 1	7081.5	1700.2	-1051.3	23.915	14.562	-7.661	-0.171	1.627	1.186	2555.7	11.034	1.000	285.0
770- J- 2	6233.7	1412.2	-916.9	23.665	14.479	-7.328	-0.171	1.627	1.186	2380.7	10.270	1.000	285.0
770- J- 3	5537.6	1184.9	-872.2	23.582	14.812	-7.578	-0.171	1.627	1.186	2248.8	9.819	1.000	285.0
770- J- 4	6021.4	1322.2	-952.5	23.415	14.312	-7.828	-0.171	1.627	1.186	2326.8	10.064	1.000	285.0
770- J- 5	7702.2	1683.0	-892.1	23.025	12.312	-6.457	-0.171	1.627	1.186	2526.6	10.673	1.000	285.0
770- J- 6	11608.1	2668.0	-1127.9	23.921	11.985	-6.802	-0.171	1.627	1.186	3162.9	14.042	1.000	285.0
770- J- 7	13898.2	3252.0	-1465.8	25.921	13.985	-8.802	-0.171	1.627	1.186	3720.5	17.950	1.000	285.0
770- J- 8	10627.5	2659.1	-1343.2	24.766	14.192	-7.849	-0.171	1.627	1.186	3192.9	13.764	1.000	285.0
770- J- 9	11042.3	2694.6	-1241.4	24.462	13.345	-7.327	-0.171	1.627	1.186	3186.5	13.959	1.000	285.0
770- J-10	11676.8	2970.4	-1357.5	25.158	14.194	-7.734	-0.171	1.627	1.186	3393.1	15.121	1.000	285.0
770- J-11	11523.6	2889.9	-1323.0	24.932	13.916	-7.673	-0.171	1.627	1.186	3333.2	14.803	1.000	285.0
770- K- 1	12671.6	3208.1	-1304.3	25.884	13.932	-7.079	-0.444	2.544	0.869	3630.4	16.469	1.000	285.0
770- K- 2	12060.9	3083.3	-1235.3	25.634	13.849	-6.746	-0.444	2.544	0.869	3517.0	15.760	1.000	285.0
770- K- 3	11316.6	2935.2	-1285.5	25.551	14.182	-6.996	-0.444	2.544	0.869	3413.3	15.184	1.000	285.0
770- K- 4	11811.3	2963.0	-1340.7	25.384	13.682	-7.246	-0.444	2.544	0.869	3440.4	15.461	1.000	285.0
770- K- 5	11455.5	2856.1	-1306.5	25.185	13.536	-7.123	-0.444	2.544	0.869	3363.4	15.045	1.000	285.0
770- K- 6	11484.7	2877.3	-1316.0	25.259	13.641	-7.167	-0.444	2.544	0.869	3381.5	15.127	1.000	285.0
770- L- 1	12477.6	3260.8	-1263.6	25.717	14.824	-8.021	0.202	0.658	1.390	3585.3	16.950	1.000	300.0
770- L- 2	12441.1	3180.9	-1220.7	25.467	14.741	-7.688	0.202	0.658	1.390	3454.8	16.042	1.000	300.0
770- L- 3	11749.5	3074.3	-1270.5	25.384	15.074	-7.938	0.202	0.658	1.390	3414.6	15.445	1.000	300.0
770- L- 4	12210.3	3074.4	-1325.5	25.217	14.574	-8.188	0.202	0.658	1.390	3431.8	15.796	1.000	300.0
770- L- 5	11302.1	2778.6	-1280.4	24.491	13.500	-7.932	0.202	0.658	1.390	3206.6	14.370	1.000	300.0
770- L- 6	11498.5	2881.6	-1315.4	24.630	14.312	-8.096	0.202	0.658	1.390	3282.8	14.835	1.000	300.0
770-1A- 1	12716.8	3451.9	-1313.0	25.619	16.106	-7.909	-5.548	7.387	0.225	4190.9	19.947	1.000	270.0
770-1A- 2	12465.8	3444.7	-1263.2	25.369	16.022	-7.575	-5.548	7.387	0.225	4139.4	19.617	1.000	270.0
770-1A- 3	12052.6	3457.3	-1315.0	25.285	16.356	-7.825	-5.548	7.387	0.225	4111.0	19.028	1.000	270.0
770-1A- 4	12482.4	3375.7	-1385.0	25.119	15.856	-8.075	-5.548	7.387	0.225	4094.9	19.538	1.000	270.0
770-1A- 5	11302.3	2987.3	-1107.6	23.119	13.856	-6.382	-5.548	7.387	0.225	3640.7	18.040	1.000	255.0
770-1A- 6	11970.8	2909.3	-1292.7	22.935	13.584	-7.276	-5.548	7.387	0.225	3631.9	18.055	1.000	255.0
770-1A- 7	11988.8	2879.5	-1314.2	22.822	13.450	-7.383	-5.548	7.387	0.225	3611.7	18.025	1.000	255.0

TABLE XXVI - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS AOS	BIS	AIS	SERVO FLAP CONTROLS DOS	DIS	DIC	HP	ALFA PAR ALFA	RAD	AZM
770-2A- 1	12661.9	3334.2	-1293.2	24.937	16.364	-7.997	-4.383	5.240	0.256	3931.5	20.019	1.000	285.0
770-2A- 2	12459.7	3332.4	-1264.7	24.687	16.281	-7.666	-4.383	5.240	0.256	3893.9	19.596	1.000	270.0
770-2A- 3	12057.9	3321.5	-1338.6	24.604	16.616	-7.914	-4.383	5.240	0.256	3868.6	19.446	1.000	270.0
770-2A- 4	12357.3	3262.1	-1382.7	24.437	16.114	-8.164	-4.383	5.240	0.256	3848.5	19.513	1.000	270.0
770-2A- 5	10770.0	2801.6	-940.6	22.437	14.114	-5.732	-4.383	5.240	0.256	3334.9	17.625	1.000	270.0
770-2A- 6	11662.8	2948.8	-1296.6	22.919	14.537	-7.614	-4.383	5.240	0.256	3570.5	18.472	1.000	270.0
770-2A- 7	11398.0	2843.7	-1315.7	22.558	14.169	-7.700	-4.383	5.240	0.256	3443.5	18.152	1.000	270.0
770-2A- 8	11465.5	2872.5	-1315.7	22.640	14.243	-7.711	-4.383	5.240	0.256	3461.1	18.314	1.000	270.0
770-4A- 1	13026.8	3344.5	-1301.5	25.333	16.170	-7.665	-3.026	3.979	0.191	3861.6	19.834	1.000	285.0
770-4A- 2	12727.3	3346.0	-1253.7	25.083	16.006	-7.332	-3.026	3.979	0.191	3810.2	19.474	1.000	270.0
770-4A- 3	12224.0	3315.5	-1327.9	25.000	16.420	-7.582	-3.026	3.979	0.191	3769.4	19.190	1.000	270.0
770-4A- 4	12026.6	3262.5	-1400.3	24.833	15.920	-7.832	-3.026	3.979	0.191	3757.5	19.280	1.000	270.0
770-4A- 5	10569.9	2696.2	-902.2	22.833	13.920	-5.301	-3.026	3.979	0.191	3194.3	16.840	1.000	270.0
770-4A- 6	11669.1	2947.2	-1283.7	23.541	14.710	-7.133	-3.026	3.979	0.171	3437.8	18.058	1.000	270.0
770-4A- 7	11311.1	2824.2	-1295.9	23.188	14.457	-7.252	-3.026	3.979	0.171	3338.4	17.696	1.000	270.0
770-4A- 8	11594.9	2899.7	-1321.4	23.412	14.649	-7.553	-3.026	3.979	0.191	3404.8	17.974	1.000	270.0
770-4A- 9	11521.2	2884.5	-1322.3	23.354	14.592	-7.334	-3.026	3.979	0.191	3389.1	17.911	1.000	270.0
770-6A- 1	12552.1	3305.8	-1313.4	24.983	16.900	-7.614	-4.365	5.030	-0.321	3913.2	20.706	1.000	285.0
770-6A- 2	12249.0	3310.4	-1263.1	24.733	16.817	-7.281	-4.365	5.030	-0.321	3866.1	20.339	1.000	270.0
770-7A- 1	12599.5	3191.7	-1261.7	24.236	16.355	-8.247	-3.225	3.182	0.531	3673.8	19.997	1.000	285.0
770-1B- 1	12063.9	3029.0	-1235.4	23.309	15.675	-11.192	-1.336	-0.516	3.577	3688.1	16.903	1.000	300.0
770-1B- 2	11692.8	2999.3	-1224.5	23.059	15.592	-10.859	-1.336	-0.516	3.577	3620.4	15.884	1.000	300.0
770-1B- 3	11050.0	2911.6	-1298.5	22.976	15.925	-11.109	-1.336	-0.516	3.577	3363.4	15.320	1.000	300.0
770-1B- 4	11930.1	2849.3	-1312.8	22.809	15.425	-11.159	-1.336	-0.516	3.577	3359.2	15.642	1.000	300.0
770-1B- 5	11396.8	2850.2	-1293.2	22.584	15.035	-11.136	-1.336	-0.516	3.577	3313.1	15.190	1.000	300.0
770-1B- 6	11536.7	2880.7	-1315.1	22.738	15.279	-11.259	-1.336	-0.516	3.577	3351.8	15.633	1.000	300.0
770-2B- 1	11180.5	2799.5	-1131.1	22.909	11.640	-12.638	-1.734	1.963	6.651	3640.9	11.878	1.000	330.0
770-2B- 2	10695.2	2674.0	-1075.7	22.659	11.557	-12.305	-1.734	1.963	6.651	3351.9	11.200	1.000	330.0
770-2B- 3	-2250.9	-2345.4	1461.8	22.575	11.893	-12.555	-1.734	1.963	6.651	-99.9	4.501	1.000	195.0
770-2B- 4	10661.8	2556.8	-1170.2	22.409	11.350	-12.805	-1.734	1.963	6.651	3286.6	10.968	1.000	330.0
770-2B- 5	11101.9	2723.8	-1244.2	22.734	11.490	-13.195	-1.734	1.963	6.651	3405.8	11.812	1.000	330.0
770-2B- 6	11156.1	2804.9	-910.0	22.771	11.196	-11.623	-1.734	1.963	6.551	3422.4	11.724	1.000	330.0
770-2B- 7	11459.6	2860.6	-1320.8	23.155	11.937	-13.563	-1.734	1.963	6.651	3508.9	12.465	1.000	330.0
770-2B- 8	11463.8	2878.0	-1315.1	23.219	12.006	-13.547	-1.734	1.963	6.651	3520.3	12.540	1.000	330.0
770-2B- 8	11463.8	2578.0	-1315.1	23.219	12.006	-13.547	-1.734	1.963	6.651	3520.3	12.540	1.000	330.0
770-3B- 1	10716.0	2487.2	-1009.5	23.268	8.190	-10.663	-3.661	7.629	6.161	3548.9	14.118	1.000	225.0
770-3B- 2	10165.3	2340.5	-929.5	23.018	8.116	-10.330	-3.661	7.629	6.161	3443.8	13.946	1.000	225.0
770-3B- 3	9558.2	2193.7	-972.8	22.935	8.448	-10.580	-3.661	7.629	6.161	3356.3	13.732	1.000	225.0
770-3B- 4	9962.5	2224.8	-1013.8	22.768	7.948	-10.830	-3.661	7.629	6.161	3380.1	13.657	1.000	225.0
770-3B- 5	11617.3	2903.4	-1276.4	24.331	9.838	-11.879	-3.661	7.629	6.161	3833.3	14.990	1.000	225.0
770-3B- 6	11639.8	2868.8	-1318.7	24.416	9.839	-12.099	-3.661	7.629	6.161	3810.4	14.935	1.000	225.0
770-3B- 7	11677.8	2877.4	-1314.1	24.427	9.820	-12.103	-3.661	7.629	6.161	3822.9	14.958	1.000	225.0
770-4B- 1	11080.9	2585.3	-1021.2	24.029	8.790	-7.243	-5.188	10.817	2.598	3744.6	16.663	1.000	240.0
770-4B- 2	10592.1	2457.7	-937.8	23.779	8.707	-6.909	-5.188	10.817	2.598	3645.0	16.506	1.000	240.0
770-4B- 3	10009.9	2312.4	-967.4	23.695	9.040	-7.159	-5.188	10.817	2.598	3558.3	16.354	1.000	240.0
770-4B- 4	10634.6	2355.4	-1023.2	23.529	8.540	-7.409	-5.188	10.817	2.598	3578.8	16.402	1.000	240.0
770-4B- 5	11466.5	2926.3	-1326.3	25.252	10.577	-8.590	-5.188	10.817	2.598	4008.2	16.927	1.000	240.0
770-4B- 6	11519.4	2865.1	-1338.5	25.058	10.257	-8.571	-5.188	10.817	2.595	3975.4	16.751	1.000	240.0
770-4B- 7	11504.6	2875.7	-1325.7	25.089	10.299	-8.514	-5.188	10.817	2.596	3982.0	16.763	1.000	240.0
770-5B- 1	11520.2	2893.7	-1216.7	24.429	12.826	-5.797	-4.787	8.338	-0.476	3719.7	18.499	1.000	255.0
770-5B- 2	11077.2	2768.7	-1137.1	24.179	12.742	-5.463	-4.787	8.338	-0.476	3620.4	18.324	1.000	255.0
770-5B- 3	10526.6	2686.0	-1171.5	24.095	13.076	-5.713	-4.787	8.338	-0.476	3594.8	18.162	1.000	255.0
770-5B- 4	10923.9	2695.4	-1230.9	23.929	12.576	-5.963	-4.787	8.338	-0.476	3561.9	18.220	1.000	255.0
770-5B- 5	11493.2	2887.0	-1315.8	24.467	12.580	-6.308	-4.787	8.338	-0.476	3744.6	18.473	1.000	255.0
770-6B- 1	12569.2	3073.8	-1249.2	24.069	16.268	-7.771	-2.860	2.672	0.014	3575.9	20.530	1.000	285.0
770-6B- 2	12250.7	3081.0	-1214.1	23.819	16.185	-7.438	-2.860	2.672	0.014	3528.4	19.945	1.000	285.0
770-6B- 3	11775.4	3052.3	-1295.1	23.736	16.518	-7.688	-2.860	2.672	0.014	3494.6	19.522	1.000	285.0
770-6B- 4	12125.1	3000.1	-1331.0	23.569	16.018	-7.938	-2.860	2.672	0.014	3477.3	19.772	1.000	285.0
770-6B- 5	11217.9	2763.2	-1259.3	22.619	15.269	-7.462	-2.860	2.672	0.014	3255.9	18.336	1.000	285.0
770-6B- 6	11512.5	2887.7	-1316.1	23.062	15.756	-7.762	-2.860	2.672	0.014	3353.3	18.911	1.000	285.0
770-7B- 1	12052.1	3073.8	-1286.5	24.339	14.905	-6.408	-3.911	5.560	-0.744	3677.0	19.489	1.000	270.0
770-7B- 2	11737.3	2821.3	-1045.1	24.089	14.821	-6.074	0.0	0.0	0.0	3162.6	17.312	1.000	285.0
770-7B- 3	11625.2	2995.6	-1222.5	24.008	14.821	-6.074	-3.911	5.560	-0.744	3591.4	19.140	1.000	270.0
770-7B- 4	11081.1	2923.8	-1263.8	24.005	15.155	-6.324	-3.911	5.560	-0.744	3529.3	18.952	1.000	270.0
770-7B- 5	11661.9	2909.2	-1323.1	23.839	14.655	-6.574	-3.911	5.560	-0.744	3538.0	19.037	1.000	270.0

TABLE XXVII. LIST OF COMPUTER RUNS FOR THE CTR-G CONFIGURATION FOR LOAD FACTORS GREATER THAN η_z = 1.0. V = 180 KTS

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO.	FZ	FX	FY	AOS	DIS	AIS	DOS	DIS	DIC	HP	ALFA	RAD	AZM
771- 1- 1	11358.9	3061.5	-1188.3	26.850	13.940	-8.693	1.563	-0.208	2.945	3564.8	13.707	1.000	315.0
771- 1- 2	11136.7	2859.1	-1166.0	26.600	13.857	-8.350	1.563	-0.208	2.945	3428.0	12.419	1.000	315.0
771- 1- 3	10511.2	2649.7	-1189.7	26.517	14.120	-8.690	1.563	-0.208	2.845	3286.2	12.289	1.000	315.0
771- 1- 4	10077.3	2727.0	-1215.9	26.350	13.690	-8.950	1.563	-0.208	2.945	3331.3	12.613	1.000	315.0
771- 1- 5	8923.3	1902.9	-1129.3	24.601	11.690	-8.932	1.563	-0.208	2.845	2810.7	10.484	1.000	315.0
771- 1- 6	13459.3	2630.8	-1641.4	25.220	10.485	-11.556	1.563	-0.208	2.845	3422.5	15.236	1.000	315.0
771- 1- 7	13459.7	2837.9	-1239.5	25.920	11.206	-9.435	1.563	-0.208	2.845	3516.4	14.966	1.000	315.0
771- 1- 8	13473.4	2848.1	-1317.4	25.790	11.186	-10.272	1.563	-0.208	2.845	3512.4	15.076	1.000	315.0
771- 1- 9	13431.0	2879.4	-1317.6	25.836	11.243	-10.039	1.563	-0.208	2.945	3520.9	15.133	1.000	315.0
771- 2- 1	11160.8	2870.7	-1201.7	26.850	13.690	-8.753	1.474	0.375	3.178	3458.6	12.279	1.000	315.0
771- 2- 2	10376.0	2849.0	-1121.4	26.400	13.407	-9.470	1.474	0.375	3.178	3339.4	11.531	1.000	315.0
771- 2- 3	9536.6	2611.4	-1145.7	26.517	13.760	-8.670	1.474	0.375	3.178	3190.7	11.061	1.000	315.0
771- 2- 4	10075.2	2512.1	-1196.5	26.350	13.240	-8.920	1.474	0.375	3.178	3235.1	11.348	1.000	315.0
771- 2- 5	7937.9	1952.2	-1117.4	24.473	11.240	-9.465	1.474	0.375	3.178	2650.3	9.332	1.000	315.0
771- 2- 6	13131.6	2680.3	-1449.3	25.258	9.810	-10.610	1.474	0.375	3.178	3403.6	13.399	1.000	315.0
771- 2- 7	13360.0	2854.6	-1246.2	25.727	10.251	-9.778	1.474	0.375	3.178	3511.1	13.733	1.000	315.0
771- 2- 8	13442.4	2849.1	-1308.3	25.732	10.272	-10.012	1.474	0.375	3.178	3510.8	13.830	1.000	315.0
771- 2- 9	13470.9	2890.7	-1315.8	25.850	10.442	-10.048	1.474	0.375	3.178	3534.2	13.955	1.000	315.0
771- 3- 1	13967.7	2997.9	-1256.3	26.410	9.830	-9.963	1.610	0.830	3.410	3655.0	13.723	1.000	315.0
771- 3- 2	13434.3	2902.7	-1219.5	26.160	9.747	-9.610	1.610	0.830	3.410	3568.9	12.983	1.000	315.0
771- 3- 3	12423.0	2779.0	-1310.8	26.077	10.080	-9.960	1.610	0.830	3.410	3487.6	12.467	1.000	315.0
771- 3- 4	13253.6	2781.1	-1363.8	25.910	9.980	-10.110	1.610	0.830	3.410	3503.1	12.764	1.000	315.0
771- 3- 5	13527.5	2897.3	-1324.4	26.218	9.876	-10.098	1.610	0.830	3.410	3583.5	13.196	1.000	315.0
771- 3- 6	13439.7	2882.5	-1318.3	26.169	9.811	-10.055	1.610	0.830	3.410	3574.1	13.131	1.000	315.0

TABLE XXVIII. LIST OF COMPUTER RUNS FOR THE CTR-C1 CONFIGURATION

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE NO	FZ	FX	FY	A0S	A1S	B1S	D0S	D1S	D1C	HP	ALFA	RAD	RPM
330-A2- 1	12757.1	1875.6	-832.4	19.059	10.936	-1.291	-1.930	2.080	-1.659	2041.5	12.975	1.000	295.0
330-A2- 2	9992.7	1702.9	-766.1	19.729	10.951	-1.658	-1.930	2.090	-1.659	1953.6	12.291	1.000	295.0
330-A2- 3	9177.3	1575.3	-741.9	18.716	11.196	-1.779	-1.930	2.080	-1.659	1919.5	11.948	1.000	295.0
330-A2- 4	9335.3	1513.2	-609.8	18.549	10.696	-1.358	-1.930	2.140	-1.659	1921.6	12.193	1.000	295.0
330-A2- 5	11612.3	2230.1	-709.0	20.598	12.657	-0.791	-1.930	2.089	-1.659	2275.7	16.035	1.000	295.0
330-A2- 6	11529.7	2200.6	-748.0	20.499	12.516	-0.737	-1.930	2.090	-1.659	2255.9	16.112	1.000	295.0
330-A3- 1	10325.6	1824.7	-759.8	18.977	11.660	-2.566	-1.319	0.599	-1.276	2025.8	12.169	1.000	295.0
330-A3- 2	10324.6	1696.0	-686.9	18.622	11.557	-2.211	-1.319	0.599	-1.276	1939.0	11.479	1.000	295.0
330-A3- 3	9332.5	1638.7	-703.7	18.556	11.899	-2.461	-1.319	0.599	-1.276	1997.6	11.092	1.000	295.0
330-A3- 4	9375.6	1622.2	-747.9	18.377	11.390	-2.711	-1.319	0.599	-1.276	1902.8	11.269	1.000	295.0
330-A3- 5	11652.1	2264.3	-777.7	20.381	11.652	-1.954	-1.319	0.599	-1.276	2266.4	13.256	1.000	295.0
330-A3- 6	11519.1	2276.3	-763.9	20.219	11.399	-1.296	-1.319	0.599	-1.276	2265.7	13.234	1.000	295.0
330-A4- 1	11531.8	1965.5	-790.0	18.292	11.616	-2.529	-2.267	1.291	-1.410	2120.0	13.650	1.000	295.0
330-A4- 2	10773.9	1839.1	-716.6	18.062	11.531	-2.196	-2.267	1.291	-1.410	2059.5	12.745	1.000	295.0
330-A4- 3	10175.2	1757.9	-768.5	17.959	11.866	-2.466	-2.267	1.291	-1.410	2033.6	12.277	1.000	295.0
330-A4- 4	10351.1	1747.8	-789.6	17.792	11.366	-2.626	-2.267	1.291	-1.410	2012.3	12.565	1.000	295.0
330-A4- 5	11573.9	2263.3	-769.8	19.576	13.566	-1.972	-2.267	1.291	-1.410	2292.0	13.958	1.000	295.0
330-A4- 6	11563.6	2210.0	-765.2	19.381	13.309	-2.003	-2.267	1.291	-1.410	2276.0	13.912	1.000	295.0
330-A5- 1	10313.9	1670.3	-729.2	19.573	11.599	-2.519	-0.391	-0.111	-1.163	1719.6	10.963	1.000	295.0
330-A5- 2	9253.4	1528.8	-658.4	19.273	11.516	-2.185	-0.391	-0.111	-1.163	1827.4	10.315	1.000	295.0
330-A5- 3	8535.2	1624.7	-668.4	19.190	11.969	-2.635	-0.391	-0.111	-1.163	1769.8	9.798	1.000	295.0
330-A5- 4	9388.6	1657.3	-696.0	19.023	11.369	-2.685	-0.391	-0.111	-1.163	1771.2	10.089	1.000	295.0
330-A5- 5	11519.8	2392.5	-691.7	21.551	14.030	-1.596	-0.391	-0.111	-1.163	2279.9	12.872	1.000	295.0
330-A5- 6	11635.6	2203.6	-752.6	21.162	13.517	-2.016	-0.391	-0.111	-1.163	2229.3	12.668	1.000	295.0
330-A6- 1	10559.0	1791.9	-736.1	18.765	11.016	-2.966	-1.362	0.992	-0.667	1995.5	11.527	1.000	295.0
330-A6- 2	9572.0	1664.8	-651.7	18.515	10.933	-2.613	-1.362	0.992	-0.667	1932.4	10.475	1.000	295.0
330-A6- 3	9315.1	1556.0	-670.2	18.632	11.266	-2.963	-1.362	0.992	-0.667	1967.3	10.399	1.000	295.0
330-A6- 4	9515.6	1576.8	-713.0	18.265	10.766	-3.113	-1.362	0.992	-0.667	1965.9	10.696	1.000	295.0
330-A6- 5	11535.6	2266.6	-725.6	20.316	12.877	-2.375	-1.362	0.992	-0.667	2258.7	13.093	1.000	295.0
330-A6- 6	11636.4	2292.8	-751.9	20.118	12.669	-2.573	-1.362	0.992	-0.667	2233.6	12.819	1.000	295.0
330-A7- 1	11259.0	1856.1	-795.1	19.001	12.163	-2.775	-1.296	0.279	-1.896	2063.1	12.911	1.000	295.0
330-A7- 2	10636.9	1760.5	-716.7	19.751	12.093	-1.762	-1.296	0.279	-1.896	1992.6	12.227	1.000	295.0
330-A7- 3	9355.3	1665.6	-741.2	19.668	12.613	-2.012	-1.296	0.279	-1.896	1935.6	11.736	1.000	295.0
330-A7- 4	10313.7	1670.5	-794.9	19.501	11.913	-2.262	-1.296	0.279	-1.896	1967.1	12.006	1.000	295.0
330-A7- 5	11621.8	2239.9	-761.7	20.556	16.663	-1.376	-1.296	0.279	-1.896	2275.9	13.791	1.000	295.0
330-A7- 6	11513.9	2214.7	-766.9	20.605	16.180	-1.666	-1.296	0.279	-1.896	2264.0	13.812	1.000	295.0
330-A8- 1	12553.3	2326.6	-729.6	19.325	11.376	-1.751	-3.353	3.725	-0.836	2631.6	15.578	1.000	270.0
330-A8- 2	11755.6	2279.1	-674.7	19.075	11.251	-1.618	-3.353	3.725	-0.836	2367.1	14.992	1.000	270.0
330-A8- 3	11132.3	2239.2	-726.1	18.997	11.586	-1.668	-3.353	3.725	-0.836	2301.7	14.929	1.000	270.0
330-A8- 4	11536.1	2228.2	-760.9	18.825	11.096	-1.918	-3.353	3.725	-0.836	2307.9	14.796	1.000	270.0
330-A8- 5	11539.0	2212.3	-764.3	18.779	11.068	-1.829	-3.353	3.725	-0.836	2293.4	14.677	1.000	270.0
330-A9- 1	12676.8	2392.0	-721.5	19.217	12.073	-2.471	-2.991	2.626	-0.653	2492.6	15.139	1.000	270.0
330-A9- 2	11912.1	2300.8	-672.0	18.967	11.990	-2.080	-2.991	2.626	-0.653	2322.8	14.445	1.000	270.0
330-A9- 3	11223.3	2239.2	-724.5	18.866	12.323	-2.338	-2.991	2.626	-0.653	2278.6	13.961	1.000	270.0
330-A9- 4	11551.8	2224.5	-758.2	18.717	11.823	-2.589	-2.991	2.626	-0.653	2282.6	14.230	1.000	270.0
330-A9- 5	11438.6	2207.8	-743.2	19.690	11.857	-2.904	-2.991	2.626	-0.653	2268.1	14.092	1.000	270.0

TABLE XXVIII - Continued

CASE NO	FZ	FX	FY	PITCH HORN CONTROLS 105	015	315	SERVO FLAP CONTROLS 015	015	01C	HP	ALFA MAX ALFA	RAD	AZM
330-A0- 1	12152.3	2357.0	-723.8	18.509	12.072	-2.429	-3.445	3.056	-0.760	2342.6	15.619	1.000	270.0
330-A0- 2	11516.0	2255.1	-671.3	18.259	11.989	-2.095	-3.445	3.056	-0.760	2316.9	14.892	1.000	270.0
330-A0- 3	11871.1	2197.4	-720.5	18.176	12.172	-2.165	-3.445	3.056	-0.760	2269.0	14.278	1.000	270.0
330-A0- 4	11373.1	2182.9	-755.0	18.009	11.822	-2.595	-3.445	3.056	-0.760	2275.5	14.599	1.000	270.0
330-A0- 5	11637.9	2239.6	-767.0	18.098	11.930	-2.560	-3.445	3.056	-0.760	2296.6	14.721	1.000	270.0
330-AA- 1	7373.2	1235.8	-505.7	20.169	10.763	-3.497	0.551	-0.491	0.026	1609.0	8.131	1.000	330.0
330-AA- 2	6332.3	1018.5	-507.0	19.998	10.690	-3.076	0.561	-0.491	0.026	1583.6	7.619	1.000	330.0
330-AA- 3	6323.6	896.7	-506.8	19.815	11.013	-3.376	0.561	-0.491	0.026	1516.9	7.093	1.000	330.0
330-AA- 4	6314.2	956.7	-549.6	19.669	10.513	-3.576	0.561	-0.491	0.026	1551.9	7.321	1.000	330.0
330-AA- 5	11572.8	2297.3	-858.0	22.276	12.399	-2.690	0.561	-0.491	0.026	2259.9	11.223	1.000	235.0
330-AA- 6	3933.0	692.3	-491.9	20.396	16.399	-6.659	0.561	-0.491	0.026	1310.6	6.229	1.000	330.0
330-AA- 7	11333.9	2238.0	-826.0	22.209	13.006	-3.605	0.561	-0.491	0.026	2237.9	11.027	1.000	235.0
330-AA- 8	11537.0	2291.1	-751.3	22.169	12.510	-3.162	0.561	-0.491	0.026	2235.2	11.095	1.000	235.0
330-AB- 1	12712.0	2438.1	-726.5	19.925	12.072	-2.614	-2.337	2.199	-0.566	2411.6	14.726	1.000	270.0
330-AB- 2	11247.5	2319.1	-673.6	19.675	11.988	-2.081	-2.337	2.199	-0.566	2329.6	14.030	1.000	270.0
330-AB- 3	11363.9	2270.3	-728.1	19.592	12.322	-2.331	-2.337	2.199	-0.566	2281.0	13.596	1.000	270.0
330-AB- 4	11332.5	2250.8	-760.9	19.425	11.822	-2.581	-2.337	2.199	-0.566	2247.7	13.892	1.000	270.0
330-AB- 5	11535.2	2277.1	-761.2	19.299	11.795	-2.479	-2.337	2.199	-0.566	2269.9	13.479	1.000	270.0
330-AC- 1	12572.1	2418.1	-724.8	19.186	11.551	-2.869	-3.013	2.812	-0.211	2427.1	15.031	1.000	270.0
330-AC- 2	11771.0	2325.9	-677.3	18.936	11.470	-2.536	-3.013	2.812	-0.211	2363.6	14.366	1.000	270.0
330-AC- 3	11375.8	2241.7	-734.6	18.953	11.993	-2.796	-3.013	2.812	-0.211	2271.6	13.851	1.000	270.0
330-AC- 4	11327.7	2245.0	-765.6	18.686	11.303	-3.036	-3.013	2.812	-0.211	2235.3	14.135	1.000	270.0
330-AC- 5	11617.5	2276.9	-767.0	18.609	11.362	-2.978	-3.013	2.812	-0.211	2266.3	13.842	1.000	270.0
330-AD- 1	12213.6	2350.5	-716.7	19.248	12.597	-1.970	-2.970	2.419	-1.018	2390.5	15.169	1.000	270.0
330-AD- 2	11515.6	2276.1	-661.7	18.998	12.513	-1.637	-2.970	2.419	-1.038	2309.6	14.517	1.000	270.0
330-AD- 3	11353.8	2236.9	-712.9	18.915	12.967	-1.987	-2.970	2.419	-1.098	2261.9	13.978	1.000	270.0
330-AD- 4	11513.3	2176.2	-747.6	18.748	12.767	-2.137	-2.970	2.419	-1.098	2267.7	14.287	1.000	270.0
330-AD- 5	11515.7	2211.9	-747.2	18.791	12.369	-2.130	-2.970	2.419	-1.038	2278.7	14.345	1.000	270.0
330-AE- 1	12336.2	2359.9	-737.2	19.098	12.590	-3.292	-2.638	1.616	-0.292	2383.7	14.131	1.000	270.0
330-AF- 2	11533.8	2259.5	-680.1	18.865	12.507	-2.949	-2.638	1.616	-0.292	2305.7	13.439	1.000	270.0
330-AF- 3	10317.3	2198.6	-730.2	18.743	12.960	-3.197	-2.638	1.616	-0.292	2257.6	12.933	1.000	270.0
330-AF- 4	11655.5	2191.4	-763.0	18.596	12.360	-3.469	-2.638	1.616	-0.292	2256.9	13.721	1.000	270.0
330-AF- 5	11671.8	2279.8	-767.3	18.699	12.451	-3.338	-2.638	1.616	-0.292	2287.9	13.285	1.000	270.0
830-AH- 1	12722.6	2469.1	-746.5	21.342	12.071	-2.400	-1.030	1.342	-0.333	2416.4	13.631	1.000	235.0
800-AH- 2	11976.0	2349.3	-687.3	21.092	11.987	-2.056	-1.030	1.342	-0.333	2331.0	12.874	1.000	265.0
800-AH- 3	16633.7	2724.6	437.3	21.008	12.321	-2.316	-1.030	1.342	-0.333	3364.1	20.611	1.000	255.0
830-AH- 4	11363.6	2266.0	-738.1	21.008	12.321	-2.316	-1.030	1.342	-0.333	2276.6	12.393	1.000	235.0
830-AH- 5	10639.7	2166.6	-929.4	21.016	13.449	-3.450	-1.030	1.342	-0.333	2198.9	11.846	1.000	265.0
800-AH- 6	11641.9	2269.6	-592.0	20.921	11.687	-1.595	-1.030	1.342	-0.333	2279.2	12.504	1.000	255.0
830-AH- 7	4069.9	383.7	-92.8	18.107	9.687	0.405	-1.030	1.342	-0.333	1271.6	6.276	1.000	235.0
800-AH- 8	11671.7	2283.6	-753.8	20.952	12.071	-2.426	-1.030	1.342	-0.333	2292.5	12.602	1.000	265.0
830-AH- 9	11646.0	2204.3	-741.9	20.729	11.769	-2.428	-1.030	1.342	-0.333	2246.2	12.393	1.000	265.0

TABLE XXIX. LIST OF COMPUTER RUNS FOR THE CTR-C2 CONFIGURATION

				PITCH HORN CONTROLS			SERVO FLAP CONTROLS				ALFA MAX		
CASE ID	FZ	FX	FY	A0S	B1S	A1S	D0S	D1S	D1C	HP	ALFA	RAD	AZM
810-A1- 1	9132.0	1722.1	-681.7	17.459	13.196	-2.291	-0.307	0.415	-2.482	1966.8	12.235	1.000	235.0
810-A1- 2	10545.3	2005.2	-882.8	17.959	10.351	-2.958	-0.307	0.415	-2.482	2152.2	13.545	1.000	245.0
810-A1- 3	9134.0	1722.1	-681.7	17.459	13.196	-2.291	-0.307	0.415	-2.482	1966.8	12.235	1.000	235.0
810-A1- 4	10545.3	2005.2	-882.8	17.559	10.351	-2.958	-0.307	0.415	-2.487	2152.2	13.545	1.000	245.0
810-A2- 1	3153.5	348.4	-273.3	17.377	10.460	-3.344	0.353	1.446	-1.899	1306.1	7.961	1.000	270.0
810-A2- 2	4625.8	821.3	-540.3	17.877	11.027	-3.711	0.353	1.446	-1.399	1545.2	9.135	1.000	270.0
810-A2- 3	6667.0	1120.0	-618.6	18.044	10.360	-3.211	0.353	1.446	-1.899	1694.4	9.640	1.000	270.0
810-A2- 4	5244.2	990.0	-593.0	18.377	11.360	-2.711	0.353	1.446	-1.899	1641.0	9.533	1.000	270.0
810-A2- 5	8043.6	1556.7	-413.6	18.485	9.360	-0.711	0.353	1.446	-1.879	1925.2	11.020	1.000	270.0
810-A2- 6	11775.5	1932.3	-484.0	18.269	6.536	-0.944	0.353	1.446	-1.879	2158.1	13.149	1.000	270.0
810-A2- 7	11624.8	1692.5	-506.6	17.410	5.633	-1.115	0.353	1.446	-1.899	2030.8	12.598	1.000	270.0
810-A2- 8	15704.1	2210.2	-1176.9	19.798	7.631	-3.570	0.353	1.446	-1.879	2560.0	17.684	1.000	270.0
810-A2- 9	16173.3	2674.3	-742.5	20.493	9.633	-1.673	0.353	1.446	-1.899	2660.8	16.279	1.000	270.0
810-A2-10	15334.0	3242.5	-88.9	22.493	11.633	0.769	0.353	1.446	-1.877	3061.9	18.263	1.000	270.0
810-A2-11	14035.1	2610.9	-643.2	20.493	9.056	-1.347	0.353	1.446	-1.879	2673.0	16.911	1.000	270.0
810-A2-12	11297.3	2048.3	-684.3	18.966	8.531	-1.748	0.353	1.446	-1.879	2231.4	13.195	1.000	270.0
810-A2-13	11500.9	2217.5	-749.4	19.336	9.378	-1.961	0.353	1.446	-1.879	2321.9	13.609	1.000	270.0
810-A3- 1	3979.2	563.1	-358.5	16.792	10.866	-3.029	0.849	-0.472	-2.060	1340.9	8.417	1.000	245.0
810-A3- 2	5716.6	1008.5	-579.6	17.292	11.031	-3.696	0.849	-0.472	-2.060	1562.3	9.590	1.000	285.0
810-A3- 3	7116.6	1286.3	-637.8	17.459	10.364	-3.196	0.849	-0.472	-2.060	1710.5	10.413	1.000	285.0
810-A3- 4	6063.5	1152.9	-525.4	17.792	11.364	-2.696	0.849	-0.472	-2.060	1653.5	10.003	1.000	295.0
810-A3- 5	11766.6	2043.1	-424.0	19.321	9.595	-0.775	0.849	-0.472	-2.060	2151.4	13.536	1.000	295.0
810-A3- 6	11751.7	2047.1	-453.8	18.352	8.730	-0.715	0.849	-0.472	-2.060	2159.1	13.536	1.000	235.0
810-A3- 7	11633.9	2334.0	-693.2	19.376	10.813	-1.302	0.849	-0.472	-2.060	2323.4	14.142	1.000	295.0
810-A3- 8	11538.3	2212.9	-738.1	19.010	10.319	-2.203	0.849	-0.472	-2.060	2255.9	13.881	1.000	265.0
810-A4- 1	9454.3	1752.4	-665.8	18.023	10.849	-3.018	1.555	-2.421	-1.740	1966.3	11.632	1.000	285.0
810-A4- 2	10761.6	2010.4	-862.3	19.523	11.016	-3.685	1.555	-2.421	-1.740	2150.9	12.958	1.000	295.0
810-A4- 3	12216.7	2163.5	-756.5	18.690	10.349	-3.195	1.555	-2.421	-1.740	2248.5	14.228	1.000	265.0
810-A4- 4	11325.4	2220.5	-703.1	19.023	11.349	-2.685	1.555	-2.421	-1.740	2247.5	13.575	1.000	215.0
810-A4- 5	11472.5	2205.6	-744.2	18.953	11.175	-2.906	1.555	-2.421	-1.740	2246.1	13.691	1.000	215.0
810-A5- 1	9221.9	1718.5	-676.2	17.265	10.266	-3.448	0.329	-1.028	-1.123	1953.7	11.230	1.000	285.0
810-A5- 2	10777.4	2031.6	-873.7	17.765	10.433	-4.115	0.329	-1.028	-1.123	2144.7	12.499	1.000	245.0
810-A5- 3	12226.6	2177.0	-815.0	17.932	9.766	-3.615	0.329	-1.028	-1.123	2247.4	13.639	1.000	245.0
810-A5- 4	11373.5	2236.2	-714.6	19.265	10.766	-3.115	0.329	-1.028	-1.123	2252.6	13.065	1.000	255.0
810-A5- 5	11533.6	2214.6	-747.1	18.164	10.547	-3.286	0.329	-1.028	-1.123	2245.6	13.138	1.000	285.0
810-A6- 1	9345.4	1772.1	-664.7	17.330	11.388	-3.915	1.002	-3.214	-1.024	2002.0	11.206	1.000	330.0
810-A6- 2	10711.0	2058.5	-855.8	17.030	11.555	-4.542	1.002	-3.214	-1.024	2188.3	12.616	1.000	330.0
810-A6- 3	12390.9	2163.1	-779.2	17.977	10.988	-4.092	1.002	-3.214	-1.024	2284.5	13.835	1.000	303.0
810-A6- 4	11473.2	2248.0	-690.4	18.330	11.988	-3.542	1.002	-3.214	-1.024	2290.3	13.176	1.000	295.0
810-A6- 5	11559.1	2206.4	-746.8	18.202	11.718	-3.893	1.002	-3.214	-1.024	2272.2	13.136	1.000	300.0
810-A7- 1	9472.6	1809.5	-698.1	17.501	11.413	-2.595	0.378	-1.861	-2.674	2017.5	12.664	1.000	265.0
810-A7- 2	10906.7	2053.7	-888.4	18.001	11.580	-3.262	0.378	-1.861	-2.674	2188.8	14.025	1.000	285.0
810-A7- 3	12233.1	2157.2	-817.6	8.168	10.913	-2.762	0.378	-1.861	-2.674	2270.4	15.312	1.000	265.0
810-A7- 4	11998.9	2298.7	-723.4	18.901	11.913	-2.262	0.378	-1.861	-2.674	2280.9	14.682	1.000	285.0
810-A7- 5	11535.1	2214.0	-747.6	18.411	11.792	-2.397	0.378	-1.861	-2.674	2278.8	14.686	1.000	285.0

TABLE XXIX - Continued

CASE ID	FZ	FX	FY	PITCH HORN CONTROLS A0S	B1S	A1S	SERVO FLAP CONTROLS D0S	D1S	D1C	HP	ALFA MAX ALFA	RAD	AZM
810-A8- 1	13173.7	2470.6	-735.6	19.131	11.043	-1.917	-0.362	0.280	-2.475	2479.4	16.333	1.000	270.0
810-A8- 2	12377.4	2419.5	-661.8	18.851	10.760	-1.996	-0.362	0.280	-2.475	2409.2	15.591	1.000	270.0
810-A8- 3	11855.2	2360.3	-711.5	18.768	11.091	-1.836	-0.362	0.280	-2.475	2361.4	15.923	1.000	235.0
810-A8- 4	12451.0	2321.9	-760.8	19.401	10.593	-2.096	-0.362	0.280	-2.475	2355.8	15.247	1.000	285.0
810-A8- 5	11910.7	2170.7	-731.9	18.296	10.413	-2.049	-0.362	0.280	-2.475	2244.1	14.280	1.000	285.0
810-A8- 6	11472.3	2207.5	-745.0	18.374	10.582	-2.046	-0.362	0.280	-2.475	2267.6	14.392	1.000	255.0
810-A9- 1	12749.8	2440.7	-735.0	18.814	11.498	-2.627	0.191	-1.387	-2.012	2431.1	15.507	1.000	285.0
810-A9- 2	12111.4	2359.8	-661.9	18.564	11.414	-2.293	0.191	-1.387	-2.012	2354.1	14.672	1.000	285.0
810-A9- 3	11376.7	2289.3	-708.2	18.491	11.749	-2.563	0.191	-1.387	-2.012	2302.0	14.055	1.000	235.0
810-A9- 4	11819.6	2262.2	-756.3	18.314	11.259	-2.793	0.191	-1.387	-2.012	2300.6	14.340	1.000	285.0
810-A9- 5	11435.9	2203.2	-742.4	18.161	11.169	-2.760	0.191	-1.387	-2.012	2259.3	13.999	1.000	285.0
810-A0- 1	13320.9	2489.0	-721.3	19.458	11.547	-2.638	-0.893	-0.631	-2.128	2507.9	16.364	1.000	245.0
810-A0- 2	12646.0	2434.2	-651.6	18.198	11.469	-2.305	-0.893	-0.631	-2.128	2417.6	15.373	1.000	285.0
810-A0- 3	11944.1	2388.2	-709.4	18.115	11.797	-2.559	-0.893	-0.631	-2.128	2389.7	14.467	1.000	245.0
810-A0- 4	12432.6	2347.8	-756.8	17.948	11.297	-2.875	-0.893	-0.631	-2.128	2386.3	15.195	1.000	245.0
810-A0- 5	11415.6	2158.3	-727.2	17.422	10.997	-2.754	-0.893	-0.631	-2.128	2247.9	14.012	1.000	245.0
810-A0- 6	11533.0	2208.1	-744.0	17.563	11.232	-2.806	-0.893	-0.631	-2.128	2278.9	14.182	1.000	265.0
810-AA- 1	12358.9	2347.0	-729.6	19.180	11.448	-2.615	1.274	-2.142	-1.896	2340.9	14.528	1.000	285.0
810-AA- 2	11291.2	2229.0	-650.1	18.930	11.364	-2.282	1.274	-2.142	-1.896	2249.1	13.687	1.000	285.0
810-AA- 3	10572.7	2147.2	-681.4	18.846	11.698	-2.512	1.274	-2.142	-1.896	2198.3	13.092	1.000	245.0
810-AA- 4	10770.6	2179.3	-731.8	18.640	11.179	-2.742	1.274	-2.142	-1.896	2195.3	13.335	1.000	265.0
810-AA- 5	11533.1	2215.5	-750.9	18.838	11.188	-2.746	1.274	-2.142	-1.896	2250.6	13.895	1.000	265.0
810-AB- 1	13336.1	2491.1	-741.9	18.782	10.937	-3.057	0.160	-0.963	-1.279	2443.8	14.939	1.000	265.0
810-AB- 2	12731.5	2490.9	-668.2	18.532	10.854	-2.724	0.160	-0.963	-1.279	2369.0	14.169	1.000	285.0
810-AB- 3	11540.9	2379.9	-715.4	18.449	11.187	-2.974	0.160	-0.963	-1.279	2312.6	13.557	1.000	285.0
810-AB- 4	12763.7	2237.9	-764.4	18.242	10.687	-3.224	0.160	-0.963	-1.279	2308.6	13.829	1.000	285.0
810-AB- 5	11531.7	2204.2	-737.3	18.066	10.570	-3.160	0.160	-0.963	-1.279	2243.5	13.273	1.000	295.0
810-AC- 1	12519.6	2392.9	-726.4	18.866	12.062	-2.193	0.221	-1.814	-2.750	2416.9	16.055	1.000	265.0
810-AC- 2	11068.0	2318.2	-654.1	18.596	11.979	-1.860	0.221	-1.814	-2.750	2341.8	15.197	1.000	265.0
810-AC- 3	11161.3	2251.2	-698.1	18.513	12.312	-2.110	0.221	-1.814	-2.750	2289.8	14.546	1.000	285.0
810-AC- 4	11592.0	2224.7	-745.8	18.346	11.912	-2.360	0.221	-1.814	-2.750	2289.4	14.850	1.000	285.0
810-AC- 5	11544.1	2207.6	-745.0	18.301	11.787	-2.367	0.221	-1.814	-2.750	2277.7	14.757	1.000	285.0
810-AD- 1	12244.8	2371.1	-725.4	18.514	11.913	-3.519	0.730	-2.873	-1.238	2380.7	14.154	1.000	265.0
810-AD- 2	11544.6	2264.4	-654.3	18.264	11.830	-3.186	0.730	-2.873	-1.238	2298.5	13.376	1.000	295.0
810-AD- 3	10621.7	2190.0	-693.7	18.180	12.163	-3.436	0.730	-2.873	-1.238	2246.8	12.821	1.000	285.0
810-AD- 4	11422.7	2160.5	-739.9	18.014	11.663	-3.686	0.730	-2.873	-1.238	2246.6	13.072	1.000	265.0
810-AD- 5	11536.6	2210.9	-748.7	18.198	11.683	-3.695	0.730	-2.873	-1.238	2275.1	13.317	1.000	265.0
810-AE- 1	15678.1	1845.0	-67.1	18.750	10.374	-3.499	0.130	-3.537	-0.944	2499.2	20.527	1.000	300.0
810-AE- 2	15577.0	1977.8	-43.6	18.500	10.290	-3.199	0.130	-3.537	-0.944	2485.7	19.477	1.000	300.0
810-AE- 3	15530.5	2108.6	-196.0	18.417	10.624	-3.433	0.130	-3.537	-0.944	2494.9	18.638	1.000	265.0
810-AE- 4	15521.3	1969.0	-210.6	18.250	10.124	-3.655	0.130	-3.537	-0.944	2457.3	19.001	1.000	300.0
810-AF- 1	10347.8	2012.4	-644.1	19.911	11.369	-2.571	3.441	-3.655	-1.666	2102.9	12.553	1.000	235.0
810-AF- 2	9330.6	1841.7	-559.6	19.661	11.244	-2.258	3.441	-3.655	-1.666	2011.3	11.854	1.000	245.0
810-AF- 3	8560.9	1743.8	-576.5	19.578	11.549	-2.509	3.441	-3.655	-1.666	1944.9	11.463	1.000	235.0
810-AF- 4	9093.8	1768.0	-622.3	19.411	11.099	-2.758	3.441	-3.655	-1.666	1961.9	11.575	1.000	265.0
810-AF- 5	11457.3	2132.4	-743.1	19.929	10.622	-2.971	3.441	-3.655	-1.666	2198.3	13.721	1.000	235.0
810-AF- 6	11447.4	2193.5	-743.8	20.147	10.980	-2.922	3.441	-3.655	-1.666	2233.5	13.870	1.000	235.0
810-AF- 7	11538.7	2211.1	-746.9	20.202	11.076	-2.922	3.441	-3.655	-1.666	2243.9	13.917	1.000	295.0
810-AF- 7	11538.7	2211.1	-746.9	20.202	11.076	-2.922	3.441	-3.655	-1.666	2243.9	13.917	1.000	235.0
810-AF- 7	11538.7	2211.1	-746.9	20.202	11.076	-2.922	3.441	-3.655	-1.666	2243.9	13.917	1.000	235.0
810-ZE- 1	15679.1	1845.1	-66.6	18.750	10.374	-3.489	0.130	-3.537	-0.944	2499.0	20.524	1.000	300.0
810-ZE- 2	15614.7	2012.3	-61.1	18.500	10.291	-3.199	0.130	-3.537	-0.944	2493.2	19.262	1.000	300.0

TABLE XXX. ADDITIONAL CTR COMPUTER RUNS

Case No.	μ	θ_r (deg)	δ_c (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_0 (deg)	B_{1s} (deg)	A_{1s} (deg)	g	wt	$K_{\theta\delta}$	$K_{\lambda\beta}$	[illegible]	F_x (lb)	F_z (lb)	F_y (lb)	P (hp)
26-27	.2	-5.5	1.0	-2.0	1.0	8.95	1.64	-.40	1.0	1.73	0.0	0.0	0.0	11519	524	288	833
26-36			1.0	-3.0	1.0	8.72	2.76	-.83						11496	524	288	835
26-45			1.0	2.0	1.0	10.11	-2.89	1.53						11516	525	288	677
26-67			2.0	-4.0	2.0	9.56	2.91	-2.23						11518	528	290	844
26-77			3.0	2.0	1.0	12.55	-3.90	2.00						11501	526	291	932
26-83			0.0	0.0	-1.0	8.41	.86	2.63						11487	523	288	828
26-90			0.0	-4.1	-1.0	7.52	5.27	.87						11506	524	287	842
26-113			-1.0	2.0	-3.0	7.97	-.01	5.62						11488	521	285	845
26-122			1.0	0.0	3.0	9.42	-1.61	-1.69						11504	516	301	856
26-130			2.0	1.0	0.0	11.05	-1.83	2.40						11499	524	268	874
26-139			2.0	0.[illegible]	-1.0	10.77	-.23	3.04						11500	524	208	856
26-145			2.0	2.0	-5.0	11.63	-.56	0.49						11493	523	289	905
26-153			2.0	-2.0	-5.0	10.49	3.89	6.61						11505	423	269	855
26-160			-.22	-1.16	-1.08	7.90	2.29	2.15						11525	525	269	830
26-170			0.0	-1.0	-4.0	8.41	3.29	5.57						11500	527	297	842
26-176			-.27	-.18	-1.21	8.07	1.29	2.72						11494	525	268	827
26-185			-1.77	.34	-7.90	7.12	4.39	10.28						11509	523	288	882
27-7	.3	-9.4	2.0	2.0	-5.0	15.6[illegible]	3.28	[illegible].22	1.0	1.73	0.0	0.0	0.0	11495	1200	29	1414
27-27			-1.0	-1.5	-1.5	10.45	6.46	1.16						11404	1198	29	1278
27-36			1.0	-2.0	1.0	12.34	5.10	-1.24						11500	1196	31	1294
27-41F			2.0	-2.0	1.0	13.34	4.39	-1.10						11493	1195	29	1306
27-50			0.0	1.0	-5.0	12.89	5.11	6.28						11514	1201	29	1325
27-59			-2.0	-2.0	-1.0	9.30	7.20	.25						11502	1200	29	1292
27-70			1.0	4.0	1.0	14.61	-.95	1.48						11511	1201	29	1463
27-79J			-1.0	-4.0	-2.0	10.10	9.14	.82						11506	1198	30	1304
27-89			1.0	4.0	-3.0	15.01	.95	5.72						11510	1203	29	1443
27-95			1.0	-2.0	-3.0	12.70	6.68	3.08						11506	1202	31	1278
27-102			-1.0	2.0	2.0	11.22	1.52	-1.11						11494	1199	29	1330
27-118			1.0	1.0	-1.0	13.47	2.74	2.25						11514	1203	29	1336
27-128			-1.0	-4.0	2.0	9.95	8.05	-3.28						11509	1202	30	1333
27-145			-1.0	-1.0	0.0	10.39	5.39	-.24						11494	1208	26	1281
27-150			-2.0	2.0	-1.0	10.32	3.38	1.87						[illegible]	1203	30	1271
27-163			-2.0	2.0	-5.0	10.90	5.17	6.19						[illegible]	1200	28	1316
27-172			-2.0	0.0	-3.0	10.00	6.13	3.13						[illegible]	1199	29	1280
27-181			-2.0	-2.0	-5.0	9.91	8.95	4.58						[illegible]	1198	30	1312
27-192			-5.0	5.0	5.0	7.91	-0.20	-3.84					30.[illegible]	[illegible]	1209	29	1397
27-202			-5.0	5.0	0.0	8.10	1.75	1.39						11532	1200	29	1308
27-210			-2.0	1.0	-2.0	10.12	4.75	2.47						11499	1197	29	1268
27-219			-2.361	.75	-2.27	9.47	5.31	2.57						11506	1200	29	1278
28-24	.4	-14.5	0.0	0.0	0.0	19.2	11.05	-3.77	1.0	1.73	0.0	0.0	30.0	11507	2220	-725	2333
28-44			1.0	1.0	1.0	21.19	11.10	-4.23						11494	2194	-739	2506
28-62			-1.0	1.0	1.0	18.53	10.49	-4.87						11516	2225	-751	2376
28-71			1.0	-1.0	1.0	20.24	11.60	-4.96						11507	2210	-747	2392
28-80			5.0	-5.0	0.0	23.53	13.70	-4.38						11519	2209	-745	2435
28-128			5.0	-5.0	-5.0	24.96	16.52	-.03						11467	2212	-760	2529
28-153C			5.0	5.0	-5.0	29.81	10.37	3.10						11486	2206	-744	3023
29-17*	.45	-17.5	5.0	5.0	5.0	34.95	16.84	-10.17						11516	2885	-1329	4174
29-25*			-1.0	-1.0	-1.0	24.21	20.86	-7.96						11508	2891	-1316	3424
29-54*			-5.0	5.0	5.0	21.69	15.89	-11.58						11455	2865	-1135	3654
29-72*			2.0	-2.0	1.0	27.34	20.73	-9.19						11543	2904	-1326	3409
29-83*			5.0	-5.0	5.0	29.68	19.28	-11.95						11484	2977	-1315	3663
29-98*			5.0	0.0	5.0	31.87	17.84	-10.74						11509	2888	-1322	3908
30-1	.322	-9.8	-2.0	1.0	-2.0	10.12	4.75	2.47	1.071	1.85	0.0	0.0	28.0	9386	969	77	997
31-1	.3	-9.4	-2.0	1.0	-2.0	10.12	4.75	2.47	1.0	1.73	0.0	0.2	30.0	9784	936	55	1140
32-1	.3	-9.4	-2.0	1.0	-2.0	10.12	4.75	2.47	1.0	1.73	0.2	0.0	30.0	13577	1435	153	1399
33-1	.3	-9.4	-2.0	1.0	-2.0	10.12	4.75	2.47	1.2	1.73	0.0	0.0	30.0	11546	1233	28	1277
34-1	.3	-9.4	-2.0	1.0	-2.0	10.12	4.75	2.47	1.0	2.2	0.0	0.0	30.0	12784	1498	242	1407
35-1**	.3	-9.4	0.1	2.5	-.5	15.07	.23	3.02	1.0	1.73	0.0	0.0	30.0	11596	1204	305	1213
36-10	.45	-17.5	5.0	-5.0	5.0	29.2	17.36	-11.8	1.0	1.73	0.0	0.0	30.0	11445	2909	-1306	3654

*These cases have -8 degrees of built-in twist.

**This case is the CTR I Configuration with the flap located at the 75% radius, all others are Configuration II with the flap located at the tip.

TABLE XXX - Continued

Case No.	b	R (ft)	r_{SP} (ft)	ω_q (xΩ)	ω_{θ_z} (xΩ)	$K_{\beta\beta}$	$K_{\delta\beta}$	$K_{\delta\theta}$	μ	α_r (deg)	V (knots)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	Q (HP)
A1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.0	0.0	0.0	8.0	0.0	0.0	16229	2.0	0.4	1587
A2												-8.0			6.0			12381	1.0	-0.2	1277
A3												-8.0			0.0			-79	0.0	0.0	416
A4												-3.0			8.0			8832	0.0	0.4	932
A5												-3.0			6.0			4794	1.0	-0.1	691
A6												-3.0			0.0			-8877	0.0	0.0	-189
A7												-6.0			6.0			9312	2.0	-0.2	1047
A8												0.0			0.0			-12010	0.0	0.0	-65
A9												0.0			6.0			-367	1.0	-0.4	310
A10												-6.0			0.0			-3517	0.0	0.2	185
A11												-6.0			-3.0			10046	0.0	0.5	-196
A12												3.0			0.0			-14674	0.0	0.0	81
A13												3.0			6.0			-6075	0.0	0.6	-67
A14												3.0			-3.0			-18815	0.0	0.6	168
B1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.2	-2.95	80.0	-6.0	0.0	-3.0	6.0	0.0	3.0	17181	-1133	752	810
B2										-3.43		-6.0	0.0	0.0	6.0	0.0	3.0	16076	-511	1150	863
B3										-3.94		6.0	0.0	3.0	6.0	0.0	3.0	14922	40	1493	814
B4										-5.74		-6.0	0.0	0.0	6.0	0.0	3.0	10812	739	188	866
B5										-2.30		-6.0	-3.0	0.0	6.0	0.0	3.0	18630	-1492	1847	847
B6										-5.28		-6.0	6.0	0.0	6.0	0.0	0.0	11864	532	-293	863
B7										-4.86		6.0	6.0	0.0	6.0	0.0	-3.0	12839	273	-853	854
B8										-3.69		-6.0	6.0	0.0	6.0	-6.0	0.0	15552	-1033	94	695
B9										-6.10		-6.0	6.0	0.0	6.0	3.0	[illegible]	9968	994	-400	895
B10										-9.14		0.0	6.0	0.0	6.0	-6.0	0.0	3121	43	-87	487
B11										-6.28		-3.0	6.0	0.0	6.0	6.0	0.0	9664	31	-159	629
B12														NO CONVERGENCE							
B13										-9.68		6.0	6.0	0.0	0.0	6.0	0.0	1902	-136	6.7	494
B14										-12.49		-3.0	6.0	0.0	0.0	-6.0	0.0	-4487	-1361	202	333
B15														NO CONVERGENCE							
B16										-6.62		6.0	6.0	0.0	3.0	-6.0	0.0	8903	-78	-17	603
B17										-13.89		3.0	6.0	0.0	3.0	-6.0	0.0	-7539	-2807	524	498
B18										-1.85		9.0	0.0	3.0	9.0	0.0	3.0	19692	-3295	2144	1641
B19										-1.87		9.0	0.0	0.0	9.0	0.0	3.0	19608	-2392	2664	1388
B20										-1.77		-9.0	0.0	3.0	9.0	0.0	3.0	19822	-1991	2866	1402
B21										-2.09		9.0	6.0	0.0	9.0	0.0	3.0	19087	-1194	891	1263
B22										-1.68		-9.0	-3.0	0.0	9.0	0.0	3.0	20022	-2551	2767	1504
B23										-1.99		-9.0	6.0	0.0	9.0	0.0	0.0	19320	-1651	129	1245
B24										-1.95		-9.0	6.0	0.0	9.0	0.0	-3.0	19415	-2061	-591	1243
B25										-1.92		-9.0	6.0	0.0	9.0	-6.0	0.0	19526	-3432	1032	1099
B26										-1.91		-15.0	6.0	0.0	15.0	3.0	0.0	19498	-1827	3413	2933
B27										-1.76		7.0	6.0	0.0	9.0	6.0	0.0	19867	-2974	413	906
B28										-1.82		-8.0	6.0	0.0	9.0	-6.0	0.0	19755	-3260	685	999
B29										-2.24		-7.0	6.0	0.0	7.0	-6.0	0.0	18767	-2085	292	761
B30										-1.96		-9.0	6.0	0.0	7.0	-6.0	0.0	19441	-3013	620	824
B31										-1.91		-8.0	6.0	0.0	7.0	-6.0	0.0	19543	-2637	434	778
B32										-1.82		-7.0	6.0	0.0	8.0	-6.0	0.0	19733	-2619	332	805
B33														NO CONVERGENCE							
B34										-1.86		-8.0	6.0	0.0	8.0	-6.0	0.0	19847	-2995	518	864
B35										-14.43		0.0	6.0	0.0	0.0	-6.0	0.0	-8789	-3052	475	427

TABLE XXX - Continued

Case No.	b	R (ft)	r_{SF} (ft)	ω_ς (xΩ)	ω_{C_t} (xΩ)	$K_{\theta\beta}$	$K_{\delta\beta}$	μ	α_r (deg)	V (knots)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	Q (ft-lb)
TE	Tip Flap Pt 1 (DCNSP) - 1000) (D DAMP - .9) Pt 1 has wrong flap location																			
TE1	4	22	19.6	1.0	1.73	0	0	.5	-20.0	160	0.0	-2.5	-1.5	26.0	16.0	-1.0	NO CONVERGENCE			
TE2											0.0	-2.5	-1.5	25.0	16.0	-1.0	11956	1793	1253	3918
TE3											0.0	2.5	-1.5	26.0	17.0	-1.0	NO CONVERGENCE (23 ITER)			
TFA	Tip Flap Pt 1 (DCNSP - 5000) (D DAMP - .9) Pt 1 has wrong flap location (machine error)																			
TF	Tip Flap Pt 1 (DCNSP - 5000) (.5 D DAMP - .9) Pt 1 has wrong flap location																			
TF1											0.0	-2.5	-1.5	26.0	16.0	-1.0	NO CONVERGENCE			
TF2											0.0	-2.5	-1.5	25.0	16.0	-1.0	NO CONVERGENCE (30 ITER)			
TF3											0.0	-2.5	-1.5	26.0	17.0	-1.0	NO CONVERGENCE (30 ITER)			
TG	Tip Flap Pt 1 (DCNSP - 100,000) (D DAMP - .9) Pt 1 has wrong flap location																			
TG1											0.0	-2.5	-1.5	26.0	18.0	-1.0	NO CONVERGENCE			
TG2											0.0	-2.5	-1.5	25.0	16.0	-1.0	NO CONVERGENCE (30 ITER)			
TG3	Continue TG2 (25 more iterations)										0.0	-2.5	-1.5	25.0	16.0	-1.0	12037	1689	1648	3931
	Tip Flap Pt 1 (DCNSP - 332) (D DAMP - .9)																			
R1								.4	-20.0		5.5	-5.5	0.0	22.5	15.4	.12	11933	4734	81	2615
R2									-20.0		5.5	-5.5	0.0	30.8	3.19	7.83	NO CONVERGENCE (30 ITER)			
R3									-8.5		5.5	-5.5	0.0	22.12	15.41	.116	10812	1769	70	2389
R4									-8.5		5.5	-5.5	0.0	22.5	15.4	.12	12637	2259	81	2615
R5									-8.5		5.5	-5.5	0.0	22.26	15.41	.116	11452	1944	77	2468
R6									-8.5		5.5	-5.5	0.0	22.26	15.41	-.2	11552	1961	18	2413
TB	Tip Flap Pt 1 (DCNSP - 332) (D DAMP - .4)																			
TB1	4	22	23.5					.5	-20.0		0.0	-2.5	-1.5	25.0	16.0	-1.0	3776	813	328	2026
T1	Tip Flap Pt 1 (DCNSP - 100,000) (D DAMP - .4)																			
T11			19.6								0.0	-2.5	-1.5	25.0	16.0	-1.0	NO CONVERGENCE			
T12											0.0	-2.5	-1.5	25.5	16.0	-1.0	NO CONVERGENCE			
T13											0.0	-2.5	-1.5	25.0	16.5	-1.0	NO CONVERGENCE			
T14											0.0	-2.5	-1.5	25.0	16.0	-1.5	NO CONVERGENCE			
T15											0.0	-2.5	-1.5	25.5	16.5	-1.5	NO CONVERGENCE			
T16																	NO CONVERGENCE			
I									(Pt 1(DCNSP - 100,000, SFAG - -.616 ϵ_o - 1)					25.0	16.0	-1.0	NO CONVERGENCE			
II	Pt 1 (DCNSP - 100,000 - SPCG - .616)																			
III	Pt 1 (DCNSP - 100,000 - SPCG - .618)																			
IV	Pt 1 (DCNSP - 1000)										0.0	-2.5	-1.5	25.0	16.0	-1.0	11874	1750	1280	3936
V	Pt 1 (SPCG - -.616, Iδ - 2.0) DCNSP - 1000																			
VI	Pt 1 (DCNSP - 1000, SPCG - -.616, Iδ - .6978)																			
VII	Pt 1 (DCNSP - 100)										0.0	-2.5	-1.5	25.0	16.0	-1.0	NO CONVERGENCE			
VIII	Pt 1 (DCNSP - 1000), SPCG - 0.0, ϵ_o - .04)										0.0	-2.5	-1.5	25.0	16.0	-1.0	NO CONVERGENCE			

TABLE XXX - Continued

Case No.	b	R (ft)	r_{SF} (ft)	ω_q $(x\Omega)$	ω_{θ_t} $(x\Omega)$	$K_{\delta\beta}$	$K_{\delta\theta}$	μ	α_r (deg)	V (knots)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	Q (HP)
Tip Flap Pt 1 (DCNSP = 322.5 lb-in/sec) (D DAMP = .222 lb-in/deg/sec) Pt 1 has wrong flap location																				
RR1	4	22	19.6	1.0	1.73	0	0	.4	-6.5	160	5.5	-5.5	0.0	16.81	11.91	-1.41	-95	-2038	95	1073
RR2														20.8	11.91	-1.41	14908	2012	-235	2551
RR3														19.948	11.756	-.822	10851	1200	-58	2158
RR4														20.3	13.0	-.68	9301	1008	-65	2050
RR5														21.129	12.731	.061	13338	1926	66	2481
RR6														22.557	15.965	.286	12252	2221	17	2558
RR7														22.12	15.41	.116	11506	1931	9	2429
Tip Flap Pt 1 (DCNSP = 322.5) (D DAMP = .222) Pt 1 has wrong flap location																				
TA1	4	22	19.6	1.0	1.73	0	0	.5	-20.0		5.5	-5.5	0.0	22.12	15.41	.116	NO CONVERGENCE			
TA2											5.5	-5.5	0.0	20.12	15.41	.116	NO CONVERGENCE			
TA3											5.5	-5.5	0.0	22.12	20.0	.116	NO CONVERGENCE			
TA4											5.5	-5.5	0.0	22.12	10.0	.116	NO CONVERGENCE			
TA5											2.0	-5.5	0.0	22.0	15	0.0	INCOMPLETE			
TA6											2.0	-2.34	0.0	22.0	15	0.0	-11731	-10398	1287	-1338
TA7											2.0	-2.34	-2.34	22.0	15	0.0	-10346	-8966	964	-1282
TA8											2.0	-2.34	-2.34	22.0	15	0.0	INCOMPLETE			
TA9											2.0	-1.0	0.0	22.0	15	0.0	-11675	-10334	1601	-1287
TA10											2.0	-1.0	-1.0	22.0	15	0.0	-11353	-9977	1518	-1323
TA11											-2.0	-2.34	-2.34	25.0	15	0.0	NO CONVERGENCE			
TA12											0.0	-2.34	-2.34	27.0	18	-5.0	NO CONVERGENCE			
TA13											0.0	-2.5	-2.5	25.0	15	0.0	NO CONVERGENCE			
TA14											0.0	-2.34	-2.34	25.0	15	0.0	9599	1253	678	3329
TA15											0.5	-2.5	-2.5	25.0	15	-1.0	7954	684	374	2930
TA16											0.0	2.5	-2.5	25.0	15	1.0	10980	1580	611	3617
TA17											0.0	-2.5	-2.0	25.0	15	-1.0	9436	1190	526	3296
TA18											0.0	-2.0	-2.0	25.0	15	-1.0	8045	730	405	2984
TA19											0.5	-2.5	-2.5	25.0	15	0.0	7022	379	477	2744
TA20											0.0	-2.5	-2.5	25.0	15	0.0	10589	1519	770	3540
TA21											0.0	-2.5	-2.0	25.0	15	0.0	8607	950	656	3123
TA22											0.0	-2.0	-2.0	25.0	15	0.0	7157	444	514	2805
TB	Tip Flap Pt 1 (DCNSP = 322.5) (D DAMP = .4) Pt 1 has wrong flap location																			
TB1											0.0	-2.5	-1.5	26.0	16.0	-1.0	NO CONVERGENCE			
TB2											0.0	-2.5	-1.5	26.0	17.0	-1.0	INCOMPLETE			
TC	Tip Flap Pt 1 (DCNSP = 322.5) (D DAMP = .4) Pt 1 has wrong flap location																			
TC1											0.0	-2.5	-1.5	26.0	16.0	-1.0	NO CONVERGENCE			
TC2											0.0	-2.5	-1.5	25.0	16.0	-1.0	4217	-594	313.6	2126
	Tip Flap Pt 1 (DCNSP = 322.5) (D DAMP = .9) Pt 1 has wrong flap location																			
TD1											0.0	-2.5	-1.5	26.0	16.0	-1.0	NO CONVERGENCE			
TD2											0.0	-2.5	-1.5	25.0	16.0	-1.0	4517	-453	318	2196
TD3											0.0	-2.5	-1.5	26.0	17.0	-1.0	6809	563	436	2826
TD4											0.0	-2.5	-1.5	26.0	16.0	-2.0	NO CONVERGENCE			
TD5											-.5	-2.5	-1.5	25.0	16.0	-1.0	8236	1000	525	3089
TD6											-.5	-2.5	-1.5	24.0	16.0	-1.0	2978	-1006	277	1780
TD7											-.5	-2.5	-1.5	25.0	17.0	-1.0	5324	37	335	2423
TD8											-.5	-2.5	-1.5	25.0	16.0	-2.0	9035	1244	391	3270
TD9											-.5	-3.0	-1.5	26.0	16.0	-1.0	NO CONVERGENCE			

TABLE XXX - Continued

Case No.	b	R (ft)	r_{SF} (ft)	ω_q (xΩ)	ω_{θ_t} (xΩ)	$K_{\theta\beta}$	$K_{\delta\beta}$	$K_{\delta\theta}$	μ	α_s (deg)	V (knots)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	Q (HP)
M1	4	22	16.2	1.0	1.731	0.0	0.0	0.0	0.4	-14.5	160	5.5	-5.5	0.0	25.0	10.0	1.0	10037	2331	180	2309
M2										-14.5		5.5	-5.5	0.0	21.1	10.0	1.0	-2484	-2152	73	134
M3										-14.5		5.5	-5.5	0.0	26.0	8.0	1.0	14484	2605	558	2891
M4										-11.5		5.5	-5.5	0.0	24.5	7.0	0.0	12937	2415	223	2504
M5										-14.5		5.5	-5.5	0.0	22.4	6.0	-0.5	11749	2061	122	2251
M6										-8.5		5.5	-5.5	0.0	23.3	5.9	-1.0	12011	786	28	2250
M7										-14.5		5.5	-5.5	0.0	23.3	5.9	-1.0	11863	2073	38	2250
M8										-14.5		5.5	-5.5	0.0	23.13	5.9	-1.1	11468	1968	13	2202
N1				1.5						-8.5		5.5	-5.5	0.0	23.3	5.9	-1.0	17319	522	536	2517
N2										-8.5					21.56	6.5	-1.0	15880	1264	-84	2184
N3										-8.5					21.56	9.5	-1.0	13196	1713	-326	2079
N4										-8.5					21.56	10.5	1.0	10891	1687	-2	1923
N5										-8.5					22.0	10.5	1.0	11885	1630	21	2023
N6										-8.5					22.0	11.0	0.75	11514	1833	-52	2014
N7										-8.5					22.34	11.58	1.18	11474	1325	-7	2057
O1				1.0	2.825					-8.5					16.9	11.8	-1.4	11813	1954	-30	2179
O2															20.0	10.0	0.0	17806	746	1518	3553
O3															18.5	13.0	-3.0	13824	2256	-299	2628
O4															20.0	10.0	-8.0	17684	282	-868	3502
O5															17.3	12.0	-0.5	12325	2083	185	2287
O6															17.3	11.8	-1.4	12664	2035	9	2310
O7															16.81	11.91	-1.41	11472	1933	-46	2139
P1					1.731	-0.5						5.5			21.0	9.0	1.0	5635	-175	139	1204
P2						-0.5						5.5			22.5	11.8	1.1	7287	133	359	1341
P3						-0.5						3.5			22.5	11.8	1.1	6425	-33	418	1280
P4						0.0						5.5			22.415	11.813	1.177	8346	1377	388	1745
P5															23.063	13.166	2.529	8152	1483	590	1785
P6															23.6	11.813	1.177	11581	1951	434	2060
P7															23.4	12.313	1.677	10186	1790	519	1960
P8															23.2	12.813	2.177	9025	1634	569	1865
P9															23.0	13.313	2.677	7736	1402	596	1745
P10															23.65	11.8	-0.5	11417	1924	110	2080
P11															23.658	11.721	-1.071	11512	1927	-6	2093
Q1							0.5								16.9	11.8	-1.4	-8326	-5306	286	-350
Q2															23.2	11.8	-1.4	9784	1834	-468	2219
Q3															24.0	11.8	-1.4	9968	1933	-266	2127
Q4															24.0	11.8	1.0	11178	2230	256	2228
Q5															24.2	10.6	0.0	13006	2290	-3	2322
Q6															23.9	10.9	0.0	12184	2174	19	2239
Q7															23.7	10.5	-0.1	11744	2088	8	2190
Q8															23.65	10.4	-0.1	11761	2073	8	2183
Q9															23.52	10.3	-0.1	11558	2021	13	2155
Q10															23.47	10.2	-0.1	11596	2012	13	2152
Q11															23.063	9.773	-0.208	11094	1852	-1	2072
Q12															23.505	9.96	-0.169	11998	2032	-13	2170
Q13															23.38	9.756	-0.137	11987	1994	-5	2152

TABLE XXX - Continued

Case No.	b	R (ft)	x_{SF} (ft)	ω_q (xΩ)	ω_{θ_t} (xΩ)	$K_{\theta\beta}$	$K_{\delta\beta}$	$K_{\delta\theta}$	μ	α_r (deg)	V (knots)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_o (deg)	B_{1c} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	Q (HP)
L1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.4	-8.5	160	0.0	5.0	3.0	25.0	15.0	1.0	11985	2093	-861	2772
L2												0.0	5.0	3.0	24.8	15.0	5.5	10742	2073	-117	2559
L3												0.0	5.0	3.0	25.5	14.6	6.0	11742	2275	70	2780
L4												0.0	5.0	3.0	25.4	13.5	5.8	12545	2160	118	2607
L5												0.0	5.0	3.0	25.0	12.5	5.0	12902	1954	11	2762
L6												0.0	5.0	3.0	24.4	12.5	5.5	11997	1979	19	2615
L7												0.0	5.0	3.0	24.1	12.5	5.5	11487	1918	-18	2536
L8												0.0	5.0	6.0	24.1	12.5	2.5	9379	1667	-457	2330
L9												0.0	5.0	6.0	25.0	12.5	4.5	10454	1969	-129	2580
L10												0.0	5.0	6.0	25.5	12.3	4.9	11515	2154	-5	2757
L11												0.0	5.0	6.0	25.6	11.9	4.9	12078	2178	33	2813
L12												0.0	5.0	6.0	25.4	11.8	4.9	11833	2133	20	2767
L13												0.0	5.0	6.0	25.4	11.5	4.9	12108	2125	42	2784
L14												0.0	5.0	6.0	25.1	11.5	4.9	11572	2050	12	2701
L15												0.0	5.0	6.0	25.0	11.2	4.9	11681	2023	23	2693
L16												0.0	5.0	6.0	24.7	10.9	4.8	11431	1936	2	2627
L17												-5.0	5.0	3.0	19.1	12.5	5.5	11868	1528	536	2373
L18												5.0	5.0	3.0	19.6	14.5	3.0	11693	1669	43	2460
L19												-5.0	5.0	3.0	19.8	16.0	3.0	10751	1794	-58	2451
L20												-5.0	5.0	3.0	20.1	16.0	3.0	11157	1837	25	2514
L21												-5.0	5.0	3.0	20.6	17.5	3.0	10627	1584	-87	2562
L22												-5.0	5.0	3.0	20.7	17.1	3.0	11081	1983	-42	2602
L23												5.0	5.0	3.0	20.9	16.9	3.0	11467	1987	-2	2649
L24												5.0	0.0	3.0	20.9	22.0	3.0	10469	2717	414	2842
L25												-5.0	0.0	3.0	20.9	18.5	1.0	12729	2218	609	2951
L26												-5.0	0.0	3.0	19.5	17.5	2.0	12680	1922	8	2752
L27												5.0	0.0	3.0	19.0	17.5	2.0	12208	1951	-83	2673
L28												-5.0	0.0	3.0	18.0	17.8	-1.0	10714	1936	129	2442
L29												5.0	0.0	3.0	18.4	17.8	0.0	11019	2028	67	2508
L30												5.0	0.0	3.0	18.5	17.7	0.4	11316	2025	29	2542
L31												5.0	0.0	3.0	18.5	17.6	0.6	11557	2021	36	2567
L32												5.0	0.0	3.0	18.6	17.2	0.6	11439	1579	85	2580
L33												-5.0	0.0	3.0	18.5	17.2	-0.8	11760	1962	57	2562
L34												-5.0	0.0	3.0	18.1	17.2	-0.8	11274	1925	-25	2464
L35												-5.0	0.0	3.0	18.3	17.2	-0.8	11527	1947	4	2524
L36												0.0	-5.0	3.0	18.9	13.1	-1.7	11696	1846	19	2244
L37												0.0	0.0	3.0	21.5	12.8	1.9	11657	1966	-5	2379
L38												0.0	5.0	0.0	23.5	14.1	6.2	11582	1840	35	2500
L39												-5.0	5.0	6.0	21.5	15.3	2.3	11256	2075	-115	2666
L40												5.0	5.0	3.0	27.3	8.6	8.0	11720	1680	224	2621
L41												5.0	-5.0	3.0	20.9	11.9	2.2	12420	1638	164	2110
L42												0.0	-5.0	-3.0	17.7	16.3	-0.3	11638	1511	231	2244
L43												5.0	-7.0	1.0	21.45	7.76	-1.21	15529	1540	227	2351
L44												5.0	-5.0	3.0	22.1	7.5	0.8	11936	1642	165	2086
L45												5.5	-5.5	0.0	21.56	1.38	9.88	17411	1399	2880	2075
L46												5.5	-5.5	0.0	19.0	1.36	5.0	13569	929	1247	1657
L47												5.5	-5.5	0.0	19.0	5.0	1.38	11008	1004	292	1642
L48												5.5	-5.5	0.0	21.56	9.89	1.38	11601	1722	111	1575
L49												5.5	-5.5	0.0	21.74	10.8	1.0	11072	1749	4	1969
L50												5.5	-5.5	0.0	22.415	11.813	1.177	11466	1944	-0.4	2090

TABLE XXX - Continued

Case No.	b	R (ft)	x_{SF} (ft)	ω_q (xΩ)	$\omega_{\theta t}$ (xΩ)	K_{03}	$K_{\delta 8}$	$K_{\delta 0}$	μ	α_r (deg)	V (knots)	δ_0 (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_0 (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	C
E1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.4	-12.0	160	-10.0	10.0	2.0	12.0	10.0	0.0	4257	-1817	-277	1508
E2												-10.5	10.5	2.5	12.0	10.0	0.0	4593	66	-274	1528
E3												-11.0	11.0	3.0	12.0	10.0	0.0	4570	64	-273	1550
E4												-11.5	11.5	3.5	12.0	10.0	0.0	4532	59	-270	1569
E5												-6.5	6.5	-1.5	12.0	10.0	0.0	4420	33	-260	1347
E6												-1.5	1.5	-6.5	12.0	10.0	0.0	3258	-199	-162	1131
E7												-6.5	6.5	-1.5	12.0	10.0	0.0	4430	33	-256	1343
E8												-11.5	11.5	3.5	12.0	10.0	0.0	4546	60	-270	1569
E9												-16.5	16.5	8.5	12.0	10.0	0.0	3792	-65	-157	1726
E10												-21.5	21.5	13.5	12.0	10.0	0.0	3190	-164	35	1999
E11												-26.5	26.5	18.5	12.0	10.0	0.0	2698	-313	356	2383
E12												-31.5	31.5	23.5	12.0	10.0	0.0	2218	-491	743	2605
E13												-26.5	26.5	18.5	12.0	10.0	0.0	2683	-305	363	2379
E14												-10.0	10.0	2.0	18.0	13.0	-4.0	10335	757	-849	2614
E15												-5.0	10.0	2.0	18.0	13.0	-4.0	4643	555	-775	1635
E16												-5.0	10.0	2.0	17.5	13.4	-3.5	3389	121	-515	1438
E17												-5.0	10.0	2.0	17.0	14.0	-3.0	2160	-150	-253	1242
E18												-5.0	10.0	2.0	16.5	14.5	-2.5	867	-483	32	1034
E19												-5.0	10.0	2.0	11.5	19.5	2.5	NO CONVERGENCE			
E20												-5.0	10.0	0.0	20.0	13.0	-4.0	8731	866	-1323	2292
E21												-5.0	10.0	0.0	22.0	18.0	4.0	5075	942	-267	2106
E22												-5.0	10.0	0.0	21.5	18.5	4.5	3911	648	-158	1886
E23												-5.0	10.0	0.0	21.0	19.0	5.0	2728	310	-36	1660
E24												-5.0	10.0	0.0	20.5	19.5	5.5	1569	-65	97	1421
E25												-5.0	10.0	0.0	22.0	18.0	4.0	7818	1546	-213	2645
E26												-5.0	10.0	0.0	21.5	18.5	4.5	9013	1896	-304	2928
E27												5.0	10.0	0.0	26.0	16.0	6.0	9761	2092	72	3138
E28												-5.0	10.0	0.0	26.5	17.0	6.0	10722	2019	254	3211
E29												-5.0	10.0	0.0	26.5	17.0	6.0	NO CONVERGENCE			
E30												-5.0	10.0	0.0	27.0	16.5	3.5	11712	1799	-3	3446
E31												-5.0	5.0	3.0	20.0	14.0	3.0	6325	1113	-19	2029
E32												-5.0	5.0	3.0	20.5	14.5	3.5	6559	1245	34	2117
E33												-5.0	5.0	3.0	21.0	15.0	4.0	6776	1375	90	2202
E34												-5.0	5.0	3.0	21.5	15.5	4.5	7096	1513	151	2292
E35												-5.0	5.0	3.0	12.99	6.97	-4.01	3474	-190	-316	1178
E36												-5.0	5.0	3.0	7.99	1.97	-9.01	1466	-731	-185	855
E37												-5.0	5.0	3.0	11.58	5.74	-5.54	2775	-384	-289	1046
E38												-5.0	5.0	3.0	6.58	10.07	-10.54	-7123	-2745	1861	-112
E39												-5.0	5.0	3.0	2.21	5.07	-9.98	-11766	-3965	2766	-416
E40												-5.0	5.0	3.0	-2.79	.07	-14.98	-14126	-3646	3812	56
E41												-5.0	5.0	3.0	2.21	5.07	-9.98	-11774	-3966	2762	-414
E42												5.0	5.0	3.0	-2.79	.07	-14.98	-14136	-3648	3815	57
E43												-5.0	5.0	3.0	22.0	14.5	2.0	9312	1814	-35	2618
E44												-5.0	5.0	3.0	22.5	15.0	2.5	9483	1936	45	2707
E45												-5.0	5.0	3.0	23.0	15.5	3.0	9653	2064	123	2793
E46												-5.0	5.0	3.0	23.5	16.5	3.5	9823	2195	217	2879
E47												-5.0	5.0	3.0	23.0	14.5	2.0	10674	2038	78	2877
E48												-5.0	5.0	3.0	23.5	14.3	1.0	11586	2043	24	3016
E49												-5.0	0.0	3.0	19.0	12.7	1.0	10334	1710	519	2565
E50												-5.0	0.0	3.0	19.5	13.0	-1.5	10867	1763	165	2639
E51												-5.0	0.0	3.0	21.5	15.0	-2.5	11819	2068	134	3017
E52												0.0	5.0	3.0	[illegible]	20.0	1.0	1297	-92	126	1210
E53												0.0	5.0	3.0	30.0	20.0	1.0	9024	2724	-658	3174

TABLE XXX - Continued

Case No.	b	R (ft)	r_{SF} (ft)	ω_q (xΩ)	ω_{θ_t} (xΩ)	K_{0s}	$K_{\delta s}$	$K_{\delta 0}$	μ	α_r (deg)	V (knots)	δ_o (deg)	δ_{1s} (deg)	δ_{1c} (deg)	A_o (deg)	B_{1s} (deg)	A_{1s} (deg)	F_z (lb)	F_x (lb)	F_y (lb)	Q (HP)
C1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.4	-14.72	160	-6.0	0.0	-3.0	6.0	0.0	3.0	6713	-225	475	1090
C2										-14.94		-6.0	0.0	0.0	6.0	0.0	3.0	4505	-369	466	1106
C3										-15.18		-6.0	0.0	3.0	6.0	0.0	3.0	2221	-780	330	1036
C4										-16.07		-6.0	6.0	0.0	6.0	0.0	3.0	-6114	-3335	235	85
C5										-14.42		-6.0	-3.0	0.0	6.0	0.0	3.0	9657	44	1210	1208
C6										-15.85		-6.0	6.0	0.0	6.0	0.0	0.0	-4096	-2538	379	320
C7										-15.62		-6.0	6.0	0.0	6.0	0.0	-3.0	-1955	-1843	339	561
C8										-15.09		-6.0	6.0	0.0	6.0	-6.0	0.0	3101	-870	175	1076
C9										-16.18		-6.0	6.0	0.0	6.0	3.0	0.0	-7120	-3647	625	-200
C10										-16.48		0.0	6.0	0.0	6.0	-6.0	0.0	-9823	-5022	913	459
C11										-15.95		3.0	6.0	0.0	6.0	-6.0	0.0	-5070	-2874	418	488
C12										-17.06		0.0	6.0	0.0	0.0	-6.0	0.0	-15058	-7757	2177	802
C13										-16.18		-6.0	6.0	0.0	0.0	-6.0	0.0	-10148	-4035	374	286
C14										-16.81		-3.0	6.0	0.0	0.0	-6.0	0.0	-13001	-5951	1147	499
C15										-16.79		0.0	6.0	0.0	3.0	-6.0	0.0	12698	-6425	1501	578
C16										-15.87		-6.0	6.0	0.0	3.0	-6.0	0.0	13364	-2329	254	546
C17										-17.00		3.0	6.0	0.0	3.0	-6.0	0.0	-14378	-8010	2434	994
C18										-13.91		-9.0	0.0	-3.0	9.0	0.0	3.0	14856	-480	2437	1575
C19										-13.90		-9.0	0.0	0.0	9.0	0.0	3.0	14854	-137	2582	1655
C20										-13.87		-9.0	0.0	3.0	9.0	0.0	3.0	15011	257	2722	1755
C21										-14.11		9.0	6.0	0.0	9.0	0.0	3.0	1379	213	751	1530
C22										-13.85		-9.0	-3.0	0.0	9.0	0.0	3.0	15477	48	3533	1840
C23										-14.27		-9.0	6.0	0.0	9.0	0.0	0.0	11122	195	410	1544
C24										-14.12		-9.0	6.0	0.0	9.0	0.0	3.0	12656	26	33	1552
C25										-13.85		-9.0	6.0	0.0	9.0	-6.0	0.0	15535	-1022	1219	1453
C26										-13.85		-15.0	6.0	0.0	15.0	3.0	0.0	15273	280	3381	2782
C27										-14.06		-7.0	6.0	0.0	9.0	-6.0	0.0	13339	-379	538	1382
C28												-8.0	6.0	0.0	9.0	-6.0	0.0	BETA GREATER THAN 2 RAD.			
C29										-13.55		-7.0	6.0	0.0	7.0	-6.0	0.0	8454	-413	301	1283
C30										-14.02		-9.0	6.0	0.0	7.0	-6.0	0.0	13801	-377	805	1266
C31										-14.27		-8.0	6.0	0.0	7.0	-6.0	0.0	11255	-425	514	1287
C32										-14.30		[illegible]	6.0	0.0	8.0	-6.0	0.0	10906	-357	404	1337
C33												-9.0	6.0	0.0	8.0	-6.0	0.0	BETA GREATER THAN 2 RAD.			
C34										-14.03		-8.0	6.0	0.0	8.0	-6.0	0.0	13608	-476	670	1325
C35										-13.24		-15.0	0.0	-3.0	15.0	0.0	3.0	20612	833	6168	4544
D1	4	22	16.2	1.0	2.0	-0.5	0.0	0.0	0.2	-4.52	80	-6.0	6.0	-3.0	6.0	-6.0	3.0	13693	-892	-508	612
E1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.2	-3.71		-6.0	6.0	-3.0	6.0	-6.0	3.0	12751	-977	264	472
F1	4	22	16.2	1.0	1.0	0.0	0.0	0.0	0.2	-2.87		-6.0	6.0	-3.0	6.0	-6.0	3.0	17425	-2437	772	552
H1	4	22	16.2	0.9	2.0	0.0	0.0	0.0	0.2	-3.60		-6.0	6.0	-3.0	6.0	-6.0	3.0	15750	-1210	312	666
I1	4	22	16.2	1.0	2.0	0.0	0.5	0.0	0.2	-4.23		-6.0	6.0	-3.0	6.0	-6.0	3.0	14353	-1174	-408	578
J1	4	22	16.2	1.0	2.0	0.0	0.0	0.0	0.2	-6.96		-6.0	6.0	-3.0	6.0	-6.0	3.0	8095	149	-337	599

APPENDIX IV
AIRFOIL SECTION CHARACTERISTICS

The aerodynamic characteristics for the airfoil sections used in this study are presented for 49 angles of attack ($0° < \alpha < 360°$), 4 Mach numbers (0.30, 0.45, 0.65, 0.80), and for 5 flap deflections (-10°, -5°, 0°, 5°, 10°). Table XXXI contains aerodynamic data for the modified Kaman 23012 airfoil without a flap. Tables XXXII and XXXIII contain data for the Kaman 23012 airfoil with a trailing flap and a faired flap, respectively. Wind tunnel test data were used directly where available for these tables and were cross-plotted, interpolated, and modified using standard NASA techniques for thickness, camber, flap angle, and Mach number effects to synthesize the tabulated coefficients. All section characteristics tabulated herein are based on the total chord of the blade or of the blade and flap, as applicable.

TABLE XXXI. AERODYNAMIC COEFFICIENT DATA FOR THE KAMAN 23012 AIRFOIL SECTION

MACH NUMBER = 0.30

ALPHA	CL	CD	CM
0.0	0.13000	0.00950	-0.01000
1.00	0.24000	0.00960	-0.01000
2.00	0.34500	0.01000	-0.01000
3.00	0.45200	0.01020	-0.01000
4.00	0.56000	0.01100	-0.01000
5.00	0.66800	0.01180	-0.01000
6.00	0.77000	0.01280	-0.01000
7.00	0.88000	0.01420	-0.01000
8.00	0.98500	0.01580	-0.01000
9.00	1.09000	0.02120	-0.01000
10.00	1.19700	0.02710	-0.01040
11.00	1.30500	0.03770	-0.01200
12.00	1.39000	0.05100	-0.01600
13.00	1.20500	0.06740	-0.02750
14.00	1.04000	0.08750	-0.04350
16.00	0.95200	0.13000	-0.07900
20.00	0.95000	0.30000	-0.11000
30.00	1.01000	0.59000	-0.17450
50.00	1.20000	1.30500	-0.33800
65.00	0.85000	1.71300	-0.43100
80.00	0.41400	1.94900	-0.50400
90.00	0.10000	2.00000	-0.53900
100.00	-0.22000	1.98000	-0.56000
110.00	-0.52000	1.87600	-0.55500
130.00	-0.95500	1.43300	-0.54500
162.00	-0.54000	0.29200	-0.30000
170.00	-0.78000	0.18100	-0.34000
175.00	-0.52000	0.06700	-0.30000
180.00	-0.10000	0.02000	0.01000
186.00	0.40000	0.04700	0.35400
192.00	0.77000	0.15900	0.34800
200.00	0.64000	0.28000	0.31800
230.00	0.93000	1.35300	0.57800
260.00	0.26000	1.95800	0.57400
270.00	-0.05000	2.00000	0.54000
280.00	-0.37000	1.97000	0.50000
300.00	-0.92000	1.66500	0.33800
330.00	-0.96000	0.68800	0.13600
345.00	-1.15000	0.23000	0.0
348.00	-1.08000	0.12050	-0.00800
349.00	-1.02500	0.07330	-0.00900
350.00	-0.95000	0.07070	-0.00950
351.00	-0.86200	0.04760	-0.01000
352.00	-0.76200	0.02840	-0.01000
354.00	-0.54100	0.01580	-0.01000
355.00	-0.43000	0.01350	-0.01000
356.00	-0.31000	0.01210	-0.01000
358.00	-0.09500	0.01100	-0.01000
360.00	0.13000	0.00950	-0.01000

TABLE XXXI - Continued

MACH NUMBER = 0.45

ALPHA	CL	CD	CM
0.0	0.12500	0.00990	-0.01300
1.00	0.24000	0.00970	-0.01200
2.00	0.35800	0.01000	-0.01040
3.00	0.48000	0.01080	-0.00950
4.00	0.60400	0.01110	-0.00800
5.00	0.73000	0.01200	-0.00700
6.00	0.85000	0.01330	-0.00600
7.00	0.96500	0.01500	-0.00400
8.00	1.07300	0.01760	-0.00200
9.00	1.17400	0.02100	0.0
10.00	1.24000	0.02550	0.00200
11.00	1.21300	0.03450	0.00600
12.00	1.12600	0.05650	-0.05600
13.00	1.03000	0.10400	-0.07500
14.00	0.99400	0.14000	-0.08100
16.00	0.95400	0.20700	-0.08900
20.00	0.95800	0.32000	-0.19700
30.00	1.03000	0.64400	-0.20000
50.00	1.20000	1.41300	-0.35800
65.00	0.85000	1.80000	-0.44500
80.00	0.41400	2.01000	-0.51600
90.00	0.10000	2.06000	-0.55000
100.00	-0.22000	2.01000	-0.57400
110.00	-0.52000	1.89500	-0.58000
130.00	-0.95500	1.48200	-0.55500
162.00	-0.54000	0.31300	-0.29500
170.00	-0.78000	0.19700	-0.30500
175.00	-0.52000	0.08100	-0.27500
180.00	-0.10000	0.01300	0.01000
186.00	0.40000	0.06000	0.27500
192.00	0.77000	0.17200	0.33000
200.00	0.64000	0.30600	0.32000
230.00	0.98000	1.42200	0.57000
260.00	0.26000	1.97200	0.59300
270.00	-0.05000	2.05800	0.55500
280.00	-0.37000	2.04000	0.51200
300.00	-0.92000	1.76500	0.40400
330.00	-0.96000	0.75300	0.15500
345.00	-1.02000	0.26000	0.02000
348.00	-1.13200	0.16350	-0.02100
349.00	-1.08500	0.12500	-0.02100
350.00	-1.02000	0.08650	-0.02050
351.00	-0.94000	0.06000	-0.02000
352.00	-0.84000	0.04100	-0.01960
354.00	-0.60500	0.01960	-0.01800
355.00	-0.48300	0.01580	-0.01750
356.00	-0.36500	0.01380	-0.01650
358.00	-0.12400	0.01100	-0.01500
360.00	0.12500	0.00990	-0.01300

TABLE XXXI - Continued

MACH NUMBER = 0.65

ALPHA	CL	CC	CM
0.0	0.14000	0.01100	-0.00800
1.00	0.27000	0.01080	-0.00400
2.00	0.40500	0.01070	0.00100
3.00	0.54400	0.01080	0.00400
4.00	0.65000	0.01150	0.00800
5.00	0.72000	0.01400	0.00960
6.00	0.76000	0.01880	0.01000
7.00	0.79000	0.02690	0.00500
8.00	0.81000	0.03780	-0.01000
9.00	0.83000	0.05160	-0.02700
10.00	0.85000	0.07050	-0.04400
11.00	0.86800	0.09970	-0.06100
12.00	0.88200	0.13410	-0.07700
13.00	0.89900	0.16520	-0.08600
14.00	0.91000	0.19320	-0.09300
16.00	0.93000	0.23850	-0.10400
20.00	0.97000	0.36500	-0.12900
30.00	1.05300	0.71000	-0.24800
50.00	1.20000	1.51000	-0.39500
65.00	0.85000	1.90200	-0.47500
80.00	0.41400	2.11500	-0.53800
90.00	0.10000	2.15300	-0.57000
100.00	-0.22000	2.11500	-0.59500
110.00	-0.52000	2.00000	-0.61000
130.00	-0.95500	1.58800	-0.57600
162.00	-0.54000	0.42000	-0.28600
170.00	-0.78000	0.21800	-0.26800
175.00	-0.52000	0.09700	-0.21000
180.00	-0.10000	0.02000	0.01000
186.00	0.40000	0.07900	0.19500
192.00	0.77000	0.18000	0.30300
200.00	0.64000	0.34700	0.32400
230.00	0.98000	1.52000	0.60800
260.00	0.26000	2.10000	0.62800
270.00	-0.05000	2.15800	0.59600
280.00	-0.37000	2.14000	0.55500
300.00	-0.92000	1.87000	0.44300
330.00	-0.96000	0.79500	0.20300
345.00	-0.89400	0.30000	0.05900
348.00	-0.85000	0.21020	0.03400
349.00	-0.83300	0.18800	0.02700
350.00	-0.81500	0.16860	0.02000
351.00	-0.79800	0.14400	0.01000
352.00	-0.77200	0.11500	-0.00600
354.00	-0.64600	0.04720	-0.03000
355.00	-0.53000	0.03000	-0.02900
356.00	-0.40000	0.02100	-0.02500
358.00	-0.14000	0.01300	-0.01600
360.00	0.14000	0.01100	-0.00800

TABLE XXXI - Continued

MACH NUMBER = 0.80

ALPHA	CL	CD	CM
0.0	0.14500	0.02210	-0.00900
1.00	0.20500	0.01820	-0.01000
2.00	0.26000	0.01990	-0.02000
3.00	0.31000	0.02490	-0.02900
4.00	0.36400	0.03450	-0.03700
5.00	0.41000	0.04880	-0.04200
6.00	0.45700	0.06580	-0.04700
7.00	0.50000	0.08550	-0.05200
8.00	0.54000	0.10630	-0.05600
9.00	0.58000	0.12560	-0.06000
10.00	0.62000	0.14500	-0.07000
11.00	0.65100	0.16300	-0.08400
12.00	0.68300	0.18200	-0.10800
13.00	0.71700	0.20350	-0.12600
14.00	0.74800	0.22570	-0.14200
16.00	0.80000	0.26730	-0.17300
20.00	0.89900	0.39400	-0.22500
30.00	1.03800	0.75000	-0.23700
50.00	1.20000	1.51000	-0.42200
65.00	0.85000	1.94000	-0.59700
80.00	0.41400	2.21500	-0.57300
90.00	0.10000	2.23000	-0.59700
100.00	-0.22000	2.26200	-0.63000
110.00	-0.52000	2.15400	-0.64000
130.00	-0.95500	1.66300	-0.60000
162.00	-0.54000	0.46000	-0.25000
170.00	-0.78000	0.22800	-0.16300
175.00	-0.52000	0.09800	-0.07900
180.00	-0.10000	0.03000	0.01000
186.00	0.40000	0.06800	0.11500
192.00	0.77000	0.21000	0.21500
200.00	0.64000	0.43300	0.33200
230.00	0.98000	1.60000	0.63200
260.00	0.26000	2.24000	0.65000
270.00	-0.05000	2.23000	0.62000
280.00	-0.37000	2.22800	0.53000
300.00	-0.92000	1.89600	0.47800
330.00	-0.96000	0.85000	0.25700
345.00	-0.66800	0.32000	0.10500
348.00	-0.58500	0.26150	0.07200
349.00	-0.54500	0.24350	0.06100
350.00	-0.52200	0.22500	0.05200
351.00	-0.49000	0.20450	0.04500
352.00	-0.45400	0.18300	0.03900
354.00	-0.38000	0.13800	0.02300
355.00	-0.34000	0.11650	0.01600
356.00	-0.30000	0.09600	0.01000
358.00	-0.17000	0.05360	0.00200
360.00	0.14500	0.02210	-0.00900

TABLE XXXII. AERODYNAMIC COEFFICIENT DATA FOR THE KAMAN 23012 AIRFOIL SECTION WITH AN EXTERNAL SERVO FLAP

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CC	CM	CMD
0.0	-0.34000	0.01000	0.07650	0.00284
1.00	-0.23000	0.00980	0.07900	0.00257
2.00	-0.12000	0.00920	0.08100	0.00230
3.00	-0.01000	0.00890	0.08200	0.00203
4.00	0.10000	0.00900	0.08400	0.00176
5.00	0.20800	0.00920	0.08560	0.00149
6.00	0.32000	0.00990	0.08600	0.00117
7.00	0.42700	0.01080	0.08700	0.00090
8.00	0.53600	0.01240	0.08750	0.00063
9.00	0.64500	0.01440	0.08700	0.00036
10.00	0.75500	0.01920	0.08640	0.00009
11.00	0.85000	0.02800	0.08580	-0.00022
12.00	0.97000	0.03940	0.08400	-0.00050
13.00	1.07700	0.05040	0.07900	-0.00077
14.00	1.11000	0.07000	0.06800	-0.00104
16.00	0.94000	0.12800	0.03300	-0.00158
20.00	0.91300	0.30000	-0.01500	-0.00280
30.00	0.98200	0.59000	-0.12650	-0.00596
50.00	1.20000	1.30500	-0.33900	-0.01151
65.00	0.85000	1.71300	-0.43100	-0.01386
80.00	0.41400	1.94800	-0.50400	-0.01544
90.00	0.10000	2.00000	-0.53900	-0.01581
100.00	-0.22000	1.96000	-0.56000	-0.01535
110.00	-0.52000	1.87600	-0.56500	-0.01422
130.00	-0.95500	1.43300	-0.54500	-0.01129
162.00	-0.54000	0.29200	-0.30000	-0.00406
170.00	-0.78000	0.18100	-0.34000	-0.00203
175.00	-0.52000	0.06700	-0.30000	-0.00068
180.00	-0.10000	0.02000	0.01000	0.00068
186.00	0.40000	0.04700	0.35400	0.00208
192.00	0.77000	0.15900	0.34800	0.00339
200.00	0.64000	0.28000	0.31800	0.00497
230.00	0.98000	1.39300	0.57800	0.01075
260.00	0.26000	1.95800	0.57400	0.01535
270.00	-0.05000	2.00000	0.54000	0.01603
280.00	-0.37000	1.97000	0.50000	0.01581
300.00	-0.92000	1.66500	0.38800	0.01377
330.00	-0.96000	0.68800	0.13600	0.00804
345.00	-1.27000	0.23000	0.06800	0.00682
348.00	-1.34000	0.13540	0.06000	0.00610
349.00	-1.31800	0.10840	0.05800	0.00582
350.00	-1.27200	0.08420	0.05800	0.00555
351.00	-1.21000	0.06270	0.05900	0.00537
352.00	-1.14700	0.04450	0.06000	0.00506
354.00	-0.97700	0.02340	0.06300	0.00452
355.00	-0.87000	0.01790	0.06500	0.00424
356.00	-0.77000	0.01510	0.06650	0.00397
358.00	-0.55000	0.01230	0.07200	0.00343
360.00	-0.34000	0.01000	0.07650	0.00264

TABLE XXXII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.26600	0.01570	0.07500	0.00461
1.00	-0.14000	0.01470	0.08000	0.00424
2.00	-0.00500	0.01450	0.08600	0.00388
3.00	0.13000	0.01480	0.09100	0.00352
4.00	0.26400	0.01520	0.09600	0.00316
5.00	0.40000	0.01650	0.10000	0.00280
6.00	0.52400	0.01880	0.10400	0.00239
7.00	0.62200	0.02180	0.10700	0.00199
8.00	0.70100	0.02480	0.10800	0.00162
9.00	0.76000	0.02950	0.10400	0.00117
10.00	0.80000	0.03810	0.08100	0.00077
11.00	0.82800	0.04920	0.04300	0.00036
12.00	0.85000	0.06800	0.01100	-0.00009
13.00	0.86800	0.09260	-0.00700	-0.00050
14.00	0.88000	0.12730	-0.02300	-0.00095
16.00	0.90500	0.18650	-0.04700	-0.00181
20.00	0.94800	0.36500	-0.08400	-0.00348
30.00	1.03000	0.71000	-0.23300	-0.00718
50.00	1.20000	1.51000	-0.39500	-0.01237
65.00	0.85000	1.90200	-0.47500	-0.01495
80.00	0.41400	2.11500	-0.53800	-0.01671
90.00	0.10000	2.16300	-0.57000	-0.01716
100.00	-0.22000	2.11500	-0.59500	-0.01671
110.00	-0.52000	2.00000	-0.61000	-0.01558
130.00	-0.95500	1.58800	-0.57600	-0.01197
162.00	-0.54000	0.42000	-0.28600	-0.00442
170.00	-0.78000	0.21800	-0.25800	-0.00203
175.00	-0.52000	0.09700	-0.21000	-0.00045
180.00	-0.10000	0.02000	0.01000	0.00108
186.00	0.40000	0.07900	0.19500	0.00248
192.00	0.77000	0.18000	0.30300	0.00384
200.00	0.64000	0.34700	0.32400	0.00564
230.00	0.98000	1.52000	0.60800	0.01156
260.00	0.26000	2.10000	0.62800	0.01639
270.00	-0.05000	2.15800	0.59600	0.01720
280.00	-0.37000	2.14000	0.55500	0.01680
300.00	-0.92000	1.87000	0.44300	0.01436
330.00	-0.96000	0.79500	0.20300	0.00853
345.00	-0.93400	0.30000	0.11300	0.00853
348.00	-0.90000	0.24900	0.09800	0.00804
349.00	-0.89000	0.23160	0.09300	0.00786
350.00	-0.87600	0.24100	0.08900	0.00768
351.00	-0.86200	0.19300	0.08500	0.00745
352.00	-0.85000	0.16810	0.08400	0.00722
354.00	-0.81300	0.10320	0.08000	0.00673
355.00	-0.76700	0.06810	0.07100	0.00646
356.00	-0.69800	0.04480	0.06300	0.00614
358.00	-0.51000	0.02200	0.06300	0.00537
360.00	-0.26600	0.01570	0.07500	0.00461

TABLE XXXII - Continued

MACH NUMBER = 0.80 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	-0.28800	0.10700	0.06400	0.00271
1.00	-0.20000	0.08800	0.06000	0.00212
2.00	0.0	0.07050	0.05800	0.00149
3.00	0.17000	0.05520	0.05100	0.00063
4.00	0.24000	0.04400	0.02800	-0.00009
5.00	0.29000	0.04000	0.01300	-0.00072
6.00	0.34200	0.04100	0.00200	-0.00126
7.00	0.39200	0.04430	-0.00600	-0.00176
8.00	0.44000	0.05000	-0.01300	-0.00221
9.00	0.48300	0.05600	-0.01900	-0.00256
10.00	0.52800	0.06500	-0.02600	-0.00307
11.00	0.56800	0.07740	-0.03300	-0.00343
12.00	0.60800	0.09000	-0.03900	-0.00384
13.00	0.64500	0.10500	-0.04900	-0.00415
14.00	0.68000	0.12200	-0.07400	-0.00447
16.00	0.74900	0.16300	-0.12900	-0.00515
20.00	0.85000	0.39400	-0.20800	-0.00632
30.00	1.00800	0.75000	-0.28700	-0.00894
50.00	1.20000	1.51000	-0.42200	-0.01330
65.00	0.85000	1.94000	-0.50700	-0.01600
80.00	0.41400	2.21500	-0.57300	-0.01780
90.00	0.10000	2.28000	-0.60700	-0.01810
100.00	-0.22000	2.26200	-0.63000	-0.01760
110.00	-0.52000	2.15400	-0.64000	-0.01650
130.00	-0.95500	1.66800	-0.60000	-0.01260
162.00	-0.94000	0.46000	-0.25000	-0.00450
170.00	-0.78000	0.22800	-0.16300	-0.00200
175.00	-0.52000	0.09800	-0.07900	-0.00030
180.00	-0.10000	0.03000	0.01000	0.00120
186.00	0.40000	0.06800	0.11500	0.00290
192.00	0.77000	0.21000	0.21500	0.00450
200.00	0.64000	0.43300	0.33200	0.00650
230.00	0.98000	1.60000	0.63200	0.01320
260.00	0.26000	2.24000	0.65000	0.01760
270.00	-0.05000	2.28000	0.62000	0.01810
280.00	-0.37000	2.22600	0.58000	0.01770
300.00	-0.92000	1.89600	0.47800	0.01520
330.00	-0.96000	0.85000	0.25700	0.00970
345.00	-0.72000	0.32000	0.13400	0.00704
348.00	-0.64700	0.35800	0.11500	0.00628
349.00	-0.62000	0.33950	0.10900	0.00601
350.00	-0.59800	0.32000	0.10300	0.00573
351.00	-0.57100	0.30500	0.09700	0.00546
352.00	-0.54800	0.28300	0.09200	0.00519
354.00	-0.49800	0.23800	0.08300	0.00465
355.00	-0.47000	0.21780	0.07900	0.00433
356.00	-0.44000	0.19750	0.07400	0.00406
358.00	-0.37300	0.15000	0.06800	0.00343
360.00	-0.28800	0.10700	0.06400	0.00271

TABLE XXXII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CC	CM	CMC
0.0	-0.11000	0.01000	0.03570	0.00162
1.00	0.0	0.00980	0.03600	0.00131
2.00	0.10500	0.00920	0.03650	0.00104
3.00	0.21300	0.00890	0.03700	0.00077
4.00	0.32200	0.00900	0.03700	0.00050
5.00	0.43000	0.00950	0.03700	0.00022
6.00	0.54000	0.01020	0.03700	-0.00004
7.00	0.65000	0.01200	0.03650	-0.00036
8.00	0.75600	0.01430	0.03600	-0.00063
9.00	0.86300	0.01820	0.03580	-0.00090
10.00	0.97000	0.02330	0.03500	-0.00117
11.00	1.08000	0.03230	0.03240	-0.00144
12.00	1.17800	0.04530	0.02600	-0.00172
13.00	1.24100	0.06060	0.01550	-0.00199
14.00	1.10000	0.07970	0.00300	-0.00226
16.00	0.94000	0.15000	-0.02950	-0.00280
20.00	0.93000	0.30000	-0.05850	-0.00402
30.00	1.00000	0.59000	-0.14550	-0.00677
50.00	1.20000	1.30500	-0.33800	-0.01151
65.00	0.85000	1.71300	-0.43100	-0.01386
80.00	0.41400	1.94800	-0.50400	-0.01544
90.00	0.10000	2.00000	-0.53900	-0.01581
100.00	-0.22000	1.98000	-0.56000	-0.01535
110.00	-0.92000	1.87600	-0.56500	-0.01422
130.00	-0.95500	1.43300	-0.54500	-0.01129
162.00	-0.54000	0.29200	-0.30000	-0.00406
170.00	-0.78000	0.18100	-0.34000	-0.00203
175.00	-0.52000	0.06700	-0.30000	-0.00068
180.00	-0.10000	0.02000	0.01000	0.00068
186.00	0.40000	0.04700	0.35400	0.00208
192.00	0.77000	0.15900	0.34800	0.00339
200.00	0.64000	0.28000	0.31800	0.00497
230.00	0.98000	1.35300	0.57800	0.01075
260.00	0.26000	1.95800	0.57400	0.01535
270.00	-0.05000	2.00000	0.54000	0.01603
280.00	-0.37000	1.97000	0.50000	0.01581
300.00	-0.92000	1.66500	0.33800	0.01377
330.00	-0.96000	0.68800	0.13600	0.00804
345.00	-1.22000	0.23000	0.03400	0.00560
348.00	-1.21600	0.12570	0.02650	0.00483
349.00	-1.17500	0.09850	0.02600	0.00456
350.00	-1.11500	0.07480	0.02600	0.00433
351.00	-1.04300	0.05450	0.02620	0.00406
352.00	-0.96000	0.03650	0.02680	0.00384
354.00	-0.77300	0.01880	0.02900	0.00325
355.00	-0.66500	0.01540	0.03000	0.00298
356.00	-0.55400	0.01350	0.03100	0.00271
358.00	-0.33000	0.01100	0.03400	0.00217
360.00	-0.11000	0.01000	0.03570	0.00162

TABLE XXXII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.08000	0.01150	0.03380	0.00190
1.00	0.03300	0.01120	0.03500	0.00158
2.00	0.15000	0.01100	0.03630	0.00131
3.00	0.27500	0.01050	0.03800	0.00099
4.00	0.39300	0.01030	0.03850	0.00068
5.00	0.52000	0.01050	0.03950	0.00041
6.00	0.64000	0.01100	0.04000	0.00009
7.00	0.75800	0.01220	0.04040	-0.00018
8.00	0.88000	0.01450	0.04060	-0.00050
9.00	1.00000	0.01770	0.04060	-0.00077
10.00	1.09000	0.02280	0.04050	-0.00108
11.00	1.14900	0.03050	0.04000	-0.00135
12.00	1.10000	0.04500	0.02400	-0.00167
13.00	1.01000	0.08500	-0.02400	-0.00199
14.00	0.96700	0.12800	-0.05300	-0.00226
16.00	0.93800	0.19250	-0.07300	-0.00284
20.00	0.93800	0.32000	-0.09000	-0.00402
30.00	1.01000	0.64400	-0.18100	-0.00673
50.00	1.20000	1.41300	-0.35800	-0.01197
65.00	0.85000	1.80000	-0.44500	-0.01445
80.00	0.41400	2.01000	-0.51600	-0.01594
90.00	0.10000	2.06000	-0.55000	-0.01626
100.00	-0.22000	2.01000	-0.57400	-0.01581
110.00	-0.52000	1.89500	-0.58000	-0.01462
130.00	-0.95500	1.48200	-0.55500	-0.01161
162.00	-0.54000	0.31300	-0.29500	-0.00429
170.00	-0.78000	0.19700	-0.30500	-0.00203
175.00	-0.52000	0.08100	-0.27500	-0.00068
180.00	-0.10000	0.01300	0.01000	0.00077
186.00	0.40000	0.06000	0.27500	0.00226
192.00	0.77000	0.17200	0.33000	0.00370
200.00	0.64000	0.30600	0.32000	0.00541
230.00	0.98000	1.42200	0.59000	0.01124
260.00	0.26000	1.99200	0.59300	0.01562
270.00	-0.05000	2.05800	0.55500	0.01626
280.00	-0.37000	2.04000	0.51200	0.01608
300.00	-0.92000	1.76500	0.40400	0.01400
330.00	-0.96000	0.75300	0.15500	0.00822
345.00	-1.05000	0.26000	0.07200	0.00614
348.00	-1.20000	0.18350	0.05000	0.00542
349.00	-1.19000	0.14900	0.03000	0.00510
350.00	-1.16000	0.10800	0.02100	0.00483
351.00	-1.10000	0.07400	0.01950	0.00456
352.00	-1.03000	0.04880	0.01950	0.00429
354.00	-0.81000	0.02230	0.02100	0.00370
355.00	-0.69000	0.01680	0.02300	0.00339
356.00	-0.57000	0.01450	0.02500	0.00307
358.00	-0.33000	0.01220	0.03000	0.00248
360.00	-0.08000	0.01150	0.03380	0.00190

TABLE XXXII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CD	CM	CHC
0.0	-0.05300	0.01250	0.03300	0.00253
1.00	0.07200	0.01210	0.03800	0.00217
2.00	0.20400	0.01260	0.04200	0.00181
3.00	0.34000	0.01340	0.04600	0.00144
4.00	0.47200	0.01420	0.05000	0.00108
5.00	0.59500	0.01580	0.05200	0.00068
6.00	0.69100	0.01850	0.05300	0.00027
7.00	0.75000	0.02230	0.05100	-0.00013
8.00	0.78800	0.02900	0.04500	-0.00054
9.00	0.81300	0.03850	0.02500	-0.00090
10.00	0.83300	0.05020	0.0	-0.00131
11.00	0.85100	0.06880	-0.01500	-0.00167
12.00	0.87700	0.09470	-0.03100	-0.00208
13.00	0.88000	0.13000	-0.04500	-0.00239
14.00	0.89200	0.16000	-0.05600	-0.00275
16.00	0.91700	0.21450	-0.07500	-0.00348
20.00	0.95800	0.36500	-0.10600	-0.00479
30.00	1.04200	0.71000	-0.24000	-0.00772
50.00	1.20000	1.51000	-0.39500	-0.01237
65.00	0.85000	1.90200	-0.47500	-0.01495
80.00	0.41400	2.11500	-0.53800	-0.01671
90.00	0.10000	2.16200	-0.57000	-0.01716
100.00	-0.22000	2.11500	-0.59500	-0.01671
110.00	-0.52000	2.00000	-0.61000	-0.01558
130.00	-0.95500	1.58800	-0.57600	-0.01197
162.00	-0.54000	0.42000	-0.28600	-0.00442
170.00	-0.78000	0.21800	-0.26800	-0.00203
175.00	-0.52000	0.09700	-0.21000	-0.00045
180.00	-0.10000	0.02000	0.01000	0.00108
186.00	0.40000	0.07900	0.19500	0.00248
192.00	0.77000	0.18000	0.30300	0.00384
200.00	0.64000	0.34700	0.32400	0.00564
230.00	0.93000	1.52000	0.60800	0.01156
260.00	0.26000	2.10000	0.62800	0.01639
270.00	-0.05000	2.15800	0.59600	0.01720
280.00	-0.37000	2.14000	0.55500	0.01680
300.00	-0.92000	1.87000	0.44300	0.01436
330.00	-0.96000	0.79500	0.20300	0.00853
345.00	-0.92000	0.30000	0.08800	0.00691
348.00	-0.88000	0.22940	0.07200	0.00628
349.00	-0.86800	0.21150	0.06900	0.00614
350.00	-0.85200	0.19100	0.06500	0.00582
351.00	-0.83800	0.16820	0.05900	0.00555
352.00	-0.82000	0.13930	0.05000	0.00528
354.00	-0.75000	0.07410	0.03400	0.00474
355.00	-0.68000	0.04660	0.02000	0.00438
356.00	-0.58000	0.03100	0.01600	0.00406
358.00	-0.32000	0.01660	0.02400	0.00330
360.00	-0.05300	0.01250	0.03300	0.00253

TABLE XXXII - Continued

MACH NUMBER = 0.80		SERVO-FLAP DEFLECTION = -5.0 DEG		
ALPHA	CL	CD	CM	CMC
0.0	-0.10000	0.06400	0.03000	0.00176
1.00	0.12000	0.04450	0.02300	0.00108
2.00	0.19300	0.03100	0.02400	0.00050
3.00	0.25100	0.02550	0.00500	-0.00023
4.00	0.30200	0.02570	-0.00500	-0.00077
5.00	0.35000	0.03150	-0.01400	-0.00121
6.00	0.40000	0.04340	-0.02100	-0.00167
7.00	0.44000	0.05750	-0.02700	-0.00212
8.00	0.48600	0.07000	-0.03200	-0.00253
9.00	0.52800	0.08400	-0.03700	-0.00293
10.00	0.56700	0.09980	-0.04200	-0.00330
11.00	0.60200	0.11630	-0.04700	-0.00366
12.00	0.64000	0.13500	-0.05500	-0.00402
13.00	0.67300	0.15400	-0.07100	-0.00433
14.00	0.71000	0.17400	-0.09800	-0.00465
16.00	0.77000	0.21600	-0.14400	-0.00528
20.00	0.86800	0.39400	-0.21500	-0.00646
30.00	1.02000	0.75000	-0.28700	-0.00917
50.00	1.20000	1.51000	-0.42200	-0.01330
65.00	0.85000	1.94000	-0.50700	-0.01600
80.00	0.41400	2.21500	-0.57300	-0.01780
90.00	0.10000	2.28000	-0.60700	-0.01810
100.00	-0.22000	2.26200	-0.63000	-0.01760
110.00	-0.52000	2.15400	-0.64000	-0.01650
130.00	-0.95500	1.66800	-0.60000	-0.01260
162.00	-0.54000	0.46000	-0.25000	-0.00450
170.00	-0.78000	0.22800	-0.16300	-0.00200
175.00	-0.52000	0.09800	-0.07900	-0.00030
180.00	-0.10000	0.03000	0.01000	0.00120
186.00	0.40000	0.06800	0.11500	0.00290
192.00	0.77000	0.21000	0.21500	0.00450
200.00	0.64000	0.43300	0.33200	0.00650
230.00	0.58000	1.60000	0.63200	0.01320
260.00	0.26000	2.24000	0.65000	0.01760
270.00	-0.05000	2.28000	0.62000	0.01810
280.00	-0.37000	2.22600	0.58000	0.01770
300.00	-0.92000	1.89600	0.47800	0.01520
330.00	-0.96000	0.85000	0.25700	0.00970
345.00	-0.70000	0.32000	0.12300	0.00650
348.00	-0.62000	0.30000	0.10100	0.00573
349.00	-0.59000	0.28300	0.09400	0.00542
350.00	-0.56200	0.26550	0.08700	0.00515
351.00	-0.53200	0.24600	0.08000	0.00488
352.00	-0.50200	0.22600	0.07400	0.00461
354.00	-0.44400	0.18650	0.06300	0.00402
355.00	-0.41300	0.16600	0.05800	0.00370
356.00	-0.38000	0.14500	0.05300	0.00339
358.00	-0.29500	0.10200	0.04300	0.00271
360.00	-0.10000	0.06400	0.03000	0.00176

TABLE XXXII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.13000	0.00950	-0.01000	0.00036
1.00	0.24000	0.00960	-0.01000	0.00009
2.00	0.34500	0.01000	-0.01000	-0.00018
3.00	0.45200	0.01020	-0.01000	-0.00045
4.00	0.56000	0.01100	-0.01000	-0.00077
5.00	0.66800	0.01180	-0.01000	-0.00099
6.00	0.77000	0.01280	-0.01000	-0.00131
7.00	0.88000	0.01420	-0.01000	-0.00158
8.00	0.98500	0.01660	-0.01000	-0.00185
9.00	1.09000	0.02120	-0.01000	-0.00212
10.00	1.19700	0.02770	-0.01040	-0.00239
11.00	1.30500	0.03770	-0.01200	-0.00266
12.00	1.39000	0.05100	-0.01600	-0.00293
13.00	1.20500	0.06740	-0.02750	-0.00321
14.00	1.04000	0.08750	-0.04350	-0.00348
16.00	0.95200	0.18000	-0.07900	-0.00402
20.00	0.95000	0.30000	-0.11000	-0.00506
30.00	1.01000	0.59000	-0.17450	-0.00745
50.00	1.20000	1.30500	-0.33900	-0.01151
65.00	0.85000	1.71300	-0.43100	-0.01386
80.00	0.41400	1.54800	-0.50400	-0.01544
90.00	0.10000	2.00000	-0.53900	-0.01581
100.00	-0.22000	1.98000	-0.55000	-0.01535
110.00	-0.92000	1.87600	-0.56500	-0.01422
130.00	-0.95500	1.43300	-0.54500	-0.01129
162.00	-0.54000	0.29200	-0.30000	-0.00406
170.00	-0.78000	0.18100	-0.34000	-0.00203
175.00	-0.52000	0.06700	-0.31000	-0.00068
180.00	-0.10000	0.02000	0.01000	0.00068
186.00	0.40000	0.04700	0.35400	0.00208
192.00	0.77000	0.15900	0.34800	0.00339
200.00	0.64000	0.28000	0.31800	0.00497
230.00	0.98000	1.35300	0.57800	0.01075
260.00	0.26000	1.55800	0.57400	0.01535
270.00	-0.05000	2.00000	0.54000	0.01603
280.00	-0.37000	1.57000	0.50000	0.01581
300.00	-0.92000	1.66500	0.33800	0.01377
330.00	-0.96000	0.68800	0.13600	0.00804
345.00	-1.15000	0.23000	0.0	0.00447
348.00	-1.08000	0.12050	-0.00800	0.00366
349.00	-1.02500	0.09330	-0.00900	0.00339
350.00	-0.95000	0.07070	-0.00950	0.00312
351.00	-0.86200	0.04760	-0.01000	0.00284
352.00	-0.76200	0.02840	-0.01000	0.00257
354.00	-0.54100	0.01580	-0.01000	0.00203
355.00	-0.43000	0.01350	-0.01000	0.00176
356.00	-0.31800	0.01210	-0.01000	0.00149
358.00	-0.09500	0.01100	-0.01000	0.00090
360.00	0.13000	0.00950	-0.01000	0.00036

TABLE XXXII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.14000	0.01100	-0.00800	0.00050
1.00	0.27000	0.01080	-0.00400	0.00009
2.00	0.40500	0.01070	0.00100	-0.00027
3.00	0.54400	0.01080	0.00400	-0.00068
4.00	0.65000	0.01150	0.00800	-0.00104
5.00	0.72000	0.01400	0.00960	-0.00140
6.00	0.76000	0.01880	0.01000	-0.00172
7.00	0.79000	0.02690	0.00500	-0.00208
8.00	0.81000	0.03780	-0.01000	-0.00239
9.00	0.83000	0.05160	-0.02700	-0.00271
10.00	0.85000	0.07050	-0.04400	-0.00302
11.00	0.86800	0.09900	-0.06100	-0.00334
12.00	0.88200	0.13410	-0.07700	-0.00366
13.00	0.89900	0.16520	-0.08600	-0.00397
14.00	0.91000	0.19320	-0.09300	-0.00429
16.00	0.93000	0.23850	-0.10400	-0.00488
20.00	0.97000	0.36500	-0.12900	-0.00596
30.00	1.05300	0.71000	-0.24800	-0.00831
50.00	1.20000	1.51000	-0.39500	-0.01237
65.00	0.85000	1.90200	-0.47500	-0.01495
80.00	0.41400	2.11500	-0.53800	-0.01671
90.00	0.10000	2.16300	-0.57000	-0.01716
100.00	-0.22000	2.11500	-0.59500	-0.01671
110.00	-0.52000	2.00000	-0.61000	-0.01558
130.00	-0.95500	1.58800	-0.57600	-0.01197
162.00	-0.54000	0.42000	-0.28600	-0.00442
170.00	-0.78000	0.21800	-0.26800	-0.00203
175.00	-0.52000	0.09700	-0.21000	-0.00045
180.00	-0.10000	0.02000	0.01000	0.00108
186.00	0.40000	0.07900	0.19500	0.00248
192.00	0.77000	0.18000	0.30300	0.00384
200.00	0.64000	0.34700	0.32400	0.00564
230.00	0.98000	1.52000	0.60800	0.01156
260.00	0.26000	2.10000	0.62800	0.01639
270.00	-0.05000	2.15800	0.59600	0.01720
280.00	-0.37000	2.14000	0.55500	0.01680
300.00	-0.92000	1.87000	0.44300	0.01436
330.00	-0.96000	0.79500	0.20300	0.00853
345.00	-0.89400	0.30000	0.05900	0.00524
348.00	-0.85000	0.21020	0.03400	0.00442
349.00	-0.83300	0.18800	0.02700	0.00415
350.00	-0.81500	0.16860	0.02000	0.00338
351.00	-0.79800	0.14400	0.01000	0.00357
352.00	-0.77200	0.11500	-0.00600	0.00330
354.00	-0.64600	0.04720	-0.03000	0.00271
355.00	-0.53000	0.03000	-0.02900	0.00235
356.00	-0.40000	0.02100	-0.02500	0.00199
358.00	-0.14000	0.01300	-0.01600	0.00122
360.00	0.14000	0.01100	-0.00800	0.00050

TABLE XXXII - Continued

MACH NUMBER = 0.80   SERVO-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.14500	0.02210	-0.00900	0.00059
1.00	0.20500	0.01820	-0.01000	0.0
2.00	0.26000	0.01990	-0.02000	-0.00054
3.00	0.31000	0.02490	-0.02900	-0.00104
4.00	0.36400	0.03450	-0.03700	-0.00149
5.00	0.41000	0.04880	-0.04200	-0.00194
6.00	0.45700	0.06580	-0.04700	-0.00235
7.00	0.50000	0.08550	-0.05200	-0.00275
8.00	0.54000	0.10630	-0.05600	-0.00316
9.00	0.58000	0.12560	-0.06000	-0.00352
10.00	0.62000	0.14500	-0.07000	-0.00384
11.00	0.65100	0.16300	-0.08400	-0.00420
12.00	0.68300	0.18200	-0.10800	-0.00452
13.00	0.71700	0.20350	-0.12600	-0.00483
14.00	0.74800	0.22570	-0.14200	-0.00515
16.00	0.80000	0.26730	-0.17300	-0.00578
20.00	0.89900	0.39400	-0.22500	-0.00695
30.00	1.03800	0.75000	-0.28700	-0.00935
50.00	1.20000	1.51000	-0.42200	-0.01330
65.00	0.85000	1.94000	-0.50700	-0.01600
80.00	0.41400	2.21500	-0.57300	-0.01780
90.00	0.10000	2.28000	-0.60700	-0.01810
100.00	-0.22000	2.26200	-0.63000	-0.01760
110.00	-0.52000	2.15400	-0.64000	-0.01650
130.00	-0.95500	1.66800	-0.60000	-0.01260
162.00	-0.54000	0.46000	-0.25000	-0.00450
170.00	-0.78000	0.22800	-0.16300	-0.00200
175.00	-0.52000	0.09800	-0.07900	-0.00030
180.00	-0.10000	0.03000	0.01000	0.00120
186.00	0.40000	0.06800	0.11500	0.00290
192.00	0.77000	0.21000	0.21500	0.00450
200.00	0.64000	0.43300	0.33200	0.00650
230.00	0.98000	1.60000	0.63200	0.01320
260.00	0.26000	2.24000	0.65000	0.01760
270.00	-0.05000	2.28000	0.62000	0.01810
280.00	-0.37000	2.22800	0.58000	0.01770
300.00	-0.92000	1.89600	0.47800	0.01520
330.00	-0.96000	0.85000	0.25700	0.00970
345.00	-0.66800	0.32000	0.10500	0.00610
348.00	-0.58500	0.26150	0.07200	0.00524
349.00	-0.54500	0.24350	0.06100	0.00497
350.00	-0.52200	0.22500	0.05200	0.00465
351.00	-0.49000	0.20450	0.04500	0.00433
352.00	-0.45400	0.18300	0.03900	0.00406
354.00	-0.38000	0.13800	0.02300	0.00339
355.00	-0.34000	0.11650	0.01600	0.00307
356.00	-0.30000	0.09600	0.01000	0.00271
358.00	-0.17000	0.05860	0.00200	0.00176
360.00	0.14500	0.02210	-0.00900	0.00059

TABLE XXXII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.36000	0.01000	-0.05700	-0.00086
1.00	0.47000	0.01020	-0.05650	-0.00117
2.00	0.58000	0.01110	-0.05600	-0.00144
3.00	0.69500	0.01200	-0.05550	-0.00172
4.00	0.80500	0.01290	-0.05500	-0.00199
5.00	0.91200	0.01400	-0.05500	-0.00226
6.00	1.02000	0.01550	-0.05500	-0.00253
7.00	1.13000	0.01780	-0.05500	-0.00280
8.00	1.24000	0.02130	-0.05550	-0.00307
9.00	1.35200	0.02700	-0.05600	-0.00339
10.00	1.45000	0.03520	-0.05650	-0.00361
11.00	1.53000	0.04650	-0.06000	-0.00393
12.00	1.50000	0.06080	-0.07000	-0.00420
13.00	1.32000	0.08000	-0.09000	-0.00447
14.00	1.19000	0.10600	-0.11000	-0.00470
16.00	0.98400	0.19500	-0.13300	-0.00524
20.00	0.96800	0.30000	-0.14500	-0.00623
30.00	1.03800	0.59000	-0.19700	-0.00840
50.00	1.20000	1.30500	-0.33800	-0.01151
65.00	0.85000	1.71300	-0.43100	-0.01386
80.00	0.41400	1.94800	-0.50400	-0.01544
90.00	0.10000	2.00000	-0.53900	-0.01581
100.00	-0.22000	1.98000	-0.56000	-0.01535
110.00	-0.52000	1.87600	-0.56500	-0.01422
130.00	-0.95500	1.43300	-0.54500	-0.01129
162.00	-0.54000	0.29200	-0.30000	-0.00406
170.00	-0.78000	0.18100	-0.34000	-0.00203
175.00	-0.52000	0.06700	-0.30000	-0.00068
180.00	-0.10000	0.02000	0.01000	0.00068
186.00	0.40000	0.04700	0.35400	0.00208
192.00	0.77000	0.15900	0.34800	0.00339
200.00	0.64000	0.28000	0.31800	0.00457
230.00	0.98000	1.35300	0.57800	0.01075
260.00	0.26000	1.95800	0.57400	0.01535
270.00	-0.05000	2.00000	0.54000	0.01603
280.00	-0.37000	1.97000	0.50000	0.01581
300.00	-0.92000	1.66500	0.38800	0.01377
330.00	-0.96000	0.68800	0.13600	0.00804
345.00	-1.02000	0.23000	-0.03200	0.00321
348.00	-0.92000	0.09820	-0.04500	0.00239
349.00	-0.84500	0.07540	-0.04800	0.00212
350.00	-0.73400	0.05420	-0.05000	0.00185
351.00	-0.63200	0.03560	-0.05200	0.00162
352.00	-0.52000	0.02320	-0.05300	0.00135
354.00	-0.30000	0.01420	-0.05500	0.00081
355.00	-0.19000	0.01280	-0.05600	0.00050
356.00	-0.08000	0.01160	-0.05650	0.00022
358.00	0.14000	0.01100	-0.05700	-0.00032
360.00	0.36000	0.01000	-0.05700	-0.00086

TABLE XXXII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CC	CM	CMC
0.0	0.37800	0.00950	-0.05800	-0.00108
1.00	0.49400	0.01000	-0.05780	-0.00140
2.00	0.61500	0.01050	-0.05650	-0.00167
3.00	0.73500	0.01200	-0.05610	-0.00199
4.00	0.85500	0.01450	-0.05600	-0.00226
5.00	0.97500	0.01680	-0.05600	-0.00257
6.00	1.09800	0.01940	-0.05600	-0.00289
7.00	1.20000	0.02240	-0.05600	-0.00321
8.00	1.29200	0.02680	-0.05700	-0.00348
9.00	1.35000	0.03300	-0.05800	-0.00379
10.00	1.33000	0.04340	-0.08000	-0.00406
11.00	1.25400	0.06200	-0.10500	-0.00433
12.00	1.16500	0.10700	-0.11500	-0.00465
13.00	1.06200	0.14900	-0.12200	-0.00492
14.00	1.01000	0.18250	-0.12900	-0.00524
16.00	0.97000	0.23800	-0.13900	-0.00578
20.00	0.97000	0.32000	-0.16100	-0.00686
30.00	1.04700	0.64400	-0.23400	-0.00917
50.00	1.20000	1.41300	-0.35800	-0.01197
65.00	0.85000	1.80000	-0.44500	-0.01445
80.00	0.41400	2.01000	-0.51600	-0.01594
90.00	0.10000	2.06000	-0.55000	-0.01626
100.00	-0.22000	2.01000	-0.57400	-0.01581
110.00	-0.52000	1.89500	-0.58000	-0.01468
130.00	-0.95500	1.48200	-0.55500	-0.01161
162.00	-0.54000	0.31300	-0.29500	-0.00429
170.00	-0.78000	0.19700	-0.30500	-0.00203
175.00	-0.52000	0.08100	-0.27500	-0.00068
180.00	-0.10000	0.01300	0.01000	0.00077
186.00	0.40000	0.06000	0.27500	0.00226
192.00	0.77000	0.17200	0.33000	0.00370
200.00	0.64000	0.30600	0.32000	0.00541
230.00	0.98000	1.42200	0.59000	0.01124
260.00	0.26000	1.99200	0.59300	0.01562
270.00	-0.05000	2.05800	0.55500	0.01626
280.00	-0.37000	2.04000	0.51200	0.01608
300.00	-0.92000	1.76500	0.40400	0.01400
330.00	-0.96000	0.75300	0.15500	0.00822
345.00	-0.95000	0.26000	-0.02300	0.00339
348.00	-0.93000	0.14500	-0.07400	0.00253
349.00	-0.87000	0.10500	-0.07600	0.00221
350.00	-0.79000	0.07100	-0.07400	0.00190
351.00	-0.70000	0.04800	-0.07200	0.00158
352.00	-0.58500	0.03280	-0.07100	0.00131
354.00	-0.34800	0.01780	-0.06700	0.00068
355.00	-0.23000	0.01450	-0.06500	0.00041
356.00	-0.10800	0.01210	-0.06400	0.00009
358.00	0.13200	0.00950	-0.06050	-0.00050
360.00	0.37800	0.00950	-0.05800	-0.00108

TABLE XXXII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.38500	0.01400	-0.05700	-0.00158
1.00	0.51600	0.01330	-0.05300	-0.00190
2.00	0.63000	0.01350	-0.04900	-0.00235
3.00	0.71200	0.01630	-0.04700	-0.00271
4.00	0.75800	0.01920	-0.05000	-0.00302
5.00	0.78600	0.02470	-0.05900	-0.00339
6.00	0.80800	0.03200	-0.07100	-0.00366
7.00	0.82800	0.04300	-0.08500	-0.00397
8.00	0.84400	0.05900	-0.09600	-0.00420
9.00	0.86000	0.08350	-0.10200	-0.00452
10.00	0.87400	0.11400	-0.11100	-0.00474
11.00	0.88800	0.14450	-0.11800	-0.00501
12.00	0.90000	0.17200	-0.12400	-0.00524
13.00	0.91200	0.19650	-0.13000	-0.00546
14.00	0.92400	0.21850	-0.13500	-0.00569
16.00	0.94800	0.25900	-0.14700	-0.00614
20.00	0.98900	0.36500	-0.19100	-0.00704
30.00	1.07000	0.71000	-0.25200	-0.00899
50.00	1.20000	1.51000	-0.39500	-0.01237
65.00	0.85000	1.90200	-0.47500	-0.01495
80.00	0.41400	2.11500	-0.53800	-0.01671
90.00	0.10000	2.16300	-0.57000	-0.01716
100.00	-0.22000	2.11500	-0.59500	-0.01671
110.00	-0.52000	2.00000	-0.61000	-0.01558
130.00	-0.95500	1.58800	-0.57600	-0.01197
162.00	-0.94000	0.42000	-0.28600	-0.00442
170.00	-0.78000	0.21800	-0.26800	-0.00203
175.00	-0.52000	0.09700	-0.21000	-0.00045
180.00	-0.10000	0.02000	0.01000	0.00108
186.00	0.40000	0.07900	0.19500	0.00248
192.00	0.77000	0.18000	0.30300	0.00384
200.00	0.64000	0.34700	0.32400	0.00564
230.00	0.98000	1.52000	0.60800	0.01156
260.00	0.26000	2.10000	0.62800	0.01639
270.00	-0.05000	2.15800	0.59600	0.01720
280.00	-0.37000	2.14000	0.55500	0.01680
300.00	-0.92000	1.87000	0.44300	0.01436
330.00	-0.96000	0.79500	0.20300	0.00853
345.00	-0.85400	0.30000	0.02400	0.00384
348.00	-0.81100	0.18770	-0.02900	0.00280
349.00	-0.79700	0.16700	-0.04100	0.00248
350.00	-0.77300	0.14300	-0.05800	0.00212
351.00	-0.73000	0.11460	-0.08600	0.00176
352.00	-0.65000	0.08300	-0.09000	0.00140
354.00	-0.42000	0.03940	-0.08300	0.00063
355.00	-0.28500	0.02900	-0.07800	0.00027
356.00	-0.15300	0.02350	-0.07400	-0.00013
358.00	0.11400	0.01700	-0.06600	-0.00086
360.00	0.38500	0.01400	-0.05700	-0.00158

TABLE XXXII - Continued

MACH NUMBER = 0.80 SERVO-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.26800	0.02910	-0.06000	-0.00054
1.00	0.32200	0.03360	-0.07000	-0.00108
2.00	0.37100	0.04250	-0.07800	-0.00153
3.00	0.41600	0.05500	-0.08300	-0.00199
4.00	0.45800	0.07150	-0.08700	-0.00239
5.00	0.50000	0.09800	-0.09100	-0.00280
6.00	0.54000	0.12150	-0.09400	-0.00321
7.00	0.57700	0.14450	-0.09800	-0.00352
8.00	0.61300	0.16600	-0.10000	-0.00388
9.00	0.64700	0.18650	-0.10600	-0.00420
10.00	0.67800	0.20660	-0.11900	-0.00452
11.00	0.70800	0.22650	-0.13200	-0.00483
12.00	0.73800	0.24550	-0.14500	-0.00510
13.00	0.76300	0.26480	-0.15800	-0.00542
14.00	0.79100	0.28380	-0.17100	-0.00569
16.00	0.84000	0.32130	-0.19500	-0.00623
20.00	0.92600	0.39400	-0.23900	-0.00731
30.00	1.05300	0.75000	-0.28700	-0.00966
50.00	1.20000	1.51000	-0.42200	-0.01330
65.00	0.85000	1.94000	-0.50700	-0.01600
80.00	0.41400	2.21500	-0.57300	-0.01780
90.00	0.10000	2.28000	-0.60700	-0.01810
100.00	-0.22000	2.26200	-0.63000	-0.01760
110.00	-0.52000	2.15400	-0.64000	-0.01650
130.00	-0.95500	1.66800	-0.60000	-0.01260
162.00	-0.54000	0.46000	-0.25000	-0.00450
170.00	-0.78000	0.22800	-0.16300	-0.00200
175.00	-0.52000	0.09800	-0.07900	-0.00030
180.00	-0.10000	0.03000	0.01000	0.00120
186.00	0.40000	0.06800	0.11500	0.00290
192.00	0.77000	0.21000	0.21500	0.00450
200.00	0.64000	0.43300	0.33200	0.00650
230.00	0.98000	1.60000	0.63200	0.01320
260.00	0.26000	2.24000	0.65000	0.01760
270.00	-0.05000	2.28000	0.62000	0.01810
280.00	-0.37000	2.22800	0.58000	0.01770
300.00	-0.92000	1.89600	0.47800	0.01520
330.00	-0.96000	0.85000	0.25700	0.00970
345.00	-0.63500	0.32000	0.08300	0.00582
348.00	-0.54000	0.20740	0.04200	0.00492
349.00	-0.50300	0.18620	0.03000	0.00461
350.00	-0.47000	0.16540	0.01900	0.00429
351.00	-0.43500	0.14500	0.00700	0.00393
352.00	-0.39600	0.12700	-0.00300	0.00357
354.00	-0.31300	0.09500	-0.02300	0.00271
355.00	-0.26200	0.08030	-0.03200	0.00230
356.00	-0.20600	0.06770	-0.04000	0.00181
358.00	0.10000	0.04460	-0.05200	0.00068
360.00	0.26800	0.02910	-0.06000	-0.00054

TABLE XXXII - Continued

MACH NUMBER = 0.30   SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.60500	0.01100	-0.10400	-0.00212
1.00	0.72000	0.01200	-0.10400	-0.00239
2.00	0.82600	0.01280	-0.10380	-0.00266
3.00	0.94000	0.01400	-0.10350	-0.00293
4.00	1.04800	0.01510	-0.10300	-0.00321
5.00	1.16000	0.01750	-0.10300	-0.00348
6.00	1.27500	0.02000	-0.10300	-0.00375
7.00	1.38000	0.02330	-0.10400	-0.00406
8.00	1.48000	0.02770	-0.10500	-0.00433
9.00	1.56400	0.03400	-0.10700	-0.00461
10.00	1.62000	0.04200	-0.11000	-0.00488
11.00	1.56500	0.05600	-0.11600	-0.00515
12.00	1.45500	0.07140	-0.12600	-0.00542
13.00	1.32000	0.09250	-0.13900	-0.00565
14.00	1.20000	0.12500	-0.15100	-0.00591
16.00	1.03300	0.21400	-0.16900	-0.00646
20.00	0.99800	0.30000	-0.18200	-0.00741
30.00	1.06300	0.59000	-0.22500	-0.00939
50.00	1.20000	1.30500	-0.33800	-0.01151
65.00	0.85000	1.71300	-0.43100	-0.01386
80.00	0.41400	1.94800	-0.50400	-0.01544
90.00	0.10000	2.00000	-0.53900	-0.01581
100.00	-0.22000	1.98000	-0.56000	-0.01535
110.00	-0.52000	1.87600	-0.56500	-0.01422
130.00	-0.95500	1.43300	-0.54500	-0.01129
162.00	-0.54000	0.29200	-0.30000	-0.00406
170.00	-0.78000	0.18100	-0.34000	-0.00203
175.00	-0.52000	0.06700	-0.30000	-0.00068
180.00	-0.10000	0.02000	0.01000	0.00068
186.00	0.40000	0.04700	0.35400	0.0020[illegible]
192.00	0.77000	0.15900	0.34600	0.003[illegible]9
200.00	0.64000	0.28000	0.31800	0.00497
230.00	0.98000	1.35300	0.57800	0.01075
260.00	0.26000	1.95800	0.57400	0.01535
270.00	-0.05000	2.00000	0.54000	0.01603
280.00	-0.37000	1.97000	0.50000	0.01581
300.00	-0.92000	1.66500	0.33800	0.01377
330.00	-0.96000	0.68800	0.13600	0.00804
345.00	-0.93000	0.23000	-0.08000	0.00203
348.00	-0.70000	0.08300	-0.09400	0.00122
349.00	-0.61000	0.06280	-0.09600	0.00095
350.00	-0.54000	0.04370	-0.09800	0.00068
351.00	-0.38600	0.02820	-0.09900	0.00041
352.00	-0.27900	0.01980	-0.10000	0.00009
354.00	-0.05500	0.01300	-0.10200	-0.00[illegible]45
355.00	0.05500	0.01200	-0.10300	-0.00072
356.00	0.16700	0.01160	-0.10400	-0.00099
358.00	0.39600	0.01100	-0.10400	-0.00153
360.00	0.60500	0.01100	-0.10400	-0.00212

TABLE XXXII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.61000	0.01140	-0.10700	-0.00257
1.00	0.72700	0.01220	-0.10600	-0.00284
2.00	0.84500	0.01400	-0.10570	-0.00312
3.00	0.96800	0.01630	-0.10450	-0.00343
4.00	1.08700	0.01970	-0.10400	-0.00370
5.00	1.21000	0.02300	-0.10380	-0.00402
6.00	1.31400	0.02700	-0.10340	-0.00433
7.00	1.40500	0.03200	-0.10300	-0.00461
8.00	1.46000	0.04000	-0.10200	-0.00488
9.00	1.45500	0.05200	-0.10400	-0.00515
10.00	1.37400	0.07300	-0.13600	-0.00542
11.00	1.27500	0.11700	-0.15100	-0.00569
12.00	1.18000	0.16100	-0.16000	-0.00596
13.00	1.09300	0.19400	-0.16750	-0.00623
14.00	1.03000	0.22000	-0.17300	-0.00650
16.00	0.98700	0.26700	-0.18400	-0.00700
20.00	0.98700	0.32000	-0.20700	-0.00755
30.00	1.06500	0.64400	-0.26500	-0.01000
50.00	1.20000	1.41300	-0.35800	-0.01197
65.00	0.85000	1.80000	-0.44500	-0.01445
80.00	0.41400	2.01000	-0.51600	-0.01594
90.00	0.10000	2.06000	-0.55000	-0.01626
100.00	-0.22000	2.01000	-0.57400	-0.01581
110.00	-0.52000	1.89500	-0.58000	-0.01468
130.00	-0.99500	1.48200	-0.55500	-0.01161
162.00	-0.54000	0.31300	-0.29500	-0.00429
170.00	-0.78000	0.19700	-0.30500	-0.00203
175.00	-0.52000	0.08100	-0.27500	-0.00068
180.00	-0.10000	0.01300	0.01000	0.00077
186.00	0.40000	0.06000	0.27500	0.00226
192.00	0.77000	0.17200	0.33000	0.00370
200.00	0.64000	0.30600	0.32000	0.00541
230.00	0.98000	1.42200	0.59000	0.01124
260.00	0.26000	1.99200	0.59300	0.01562
270.00	-0.05000	2.05800	0.55500	0.01626
280.00	-0.37000	2.04000	0.51200	0.01608
300.00	-0.92000	1.76500	0.40400	0.01400
330.00	-0.96000	0.75300	0.15500	0.00822
345.00	-0.68700	0.26000	-0.10300	0.00199
348.00	-0.77000	0.12100	-0.12200	0.00108
349.00	-0.68600	0.08500	-0.12100	0.00077
350.00	-0.59000	0.05100	-0.11900	0.00045
351.00	-0.47800	0.03560	-0.11800	0.00018
352.00	-0.35500	0.02660	-0.11600	-0.00013
354.00	-0.11600	0.01550	-0.11400	-0.00072
355.00	0.00500	0.01300	-0.11200	-0.00104
356.00	0.12500	0.01130	-0.11100	-0.00131
358.00	0.36500	0.01010	-0.10900	-0.00194
360.00	0.61000	0.01140	-0.10700	-0.00257

TABLE XXXII - Continued

MACH NUMBER = 0.65   SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CC	CM	CMC
0.0	0.60000	0.01820	-0.11000	-0.00370
1.00	0.69200	0.01860	-0.10600	-0.00406
2.00	0.75000	0.02000	-0.10400	-0.00433
3.00	0.78000	0.02350	-0.10800	-0.00465
4.00	0.80800	0.02910	-0.11900	-0.00492
5.00	0.82800	0.03770	-0.12800	-0.00519
6.00	0.84200	0.04900	-0.13600	-0.00546
7.00	0.86[illegible]00	0.66500	-0.14100	-0.00569
8.00	0.87200	0.92000	-0.14400	-0.00591
9.00	0.88900	0.11850	-0.15000	-0.00614
10.00	0.90100	0.14950	-0.15400	-0.00632
11.00	0.91400	0.17700	-0.15700	-0.00655
12.00	0.92700	0.20200	-0.16100	-0.00673
13.00	0.93800	0.22300	-0.16500	-0.00691
14.00	0.94800	0.24200	-0.16900	-0.00713
16.00	0.96900	0.27750	-0.17800	-0.00745
20.00	1.00700	0.36500	-0.19900	-0.00808
30.00	1.08600	0.71000	-0.24300	-0.00948
50.00	1.20000	1.51000	-0.39500	-0.01237
65.00	0.85000	1.90200	-0.47500	-0.01495
80.00	0.41400	2.11500	-0.53800	-0.01671
90.00	0.10000	2.16300	-0.57000	-0.01716
100.00	-0.22000	2.11500	-0.59500	-0.01671
110.00	-0.52000	2.00000	-0.61000	-0.01558
130.00	-0.95500	1.58800	-0.57600	-0.01197
162.00	-0.54000	0.42000	-0.28600	-0.00442
170.00	-0.78000	0.21800	-0.26800	-0.00203
175.00	-0.52000	0.09700	-0.21000	-0.00045
180.00	-0.10000	0.02000	0.01000	0.00108
186.00	0.40000	0.07900	0.19500	0.00248
192.00	0.77000	0.18000	0.30300	0.00384
200.00	0.64000	0.34700	0.32400	0.00564
230.00	0.98000	1.52000	0.60800	0.01156
260.00	0.26000	2.10000	0.62800	0.01639
270.00	-0.05000	2.15800	0.59600	0.01720
280.00	-0.37000	2.14000	0.55500	0.01680
300.00	-0.92000	1.87000	0.44300	0.01436
330.00	-0.96000	0.79500	0.20300	0.00853
345.00	-0.83000	0.30000	-0.00900	0.00194
348.00	-0.7[illegible]800	0.16750	-0.09000	0.00077
349.00	-0.74800	0.14300	-0.11500	0.00041
350.00	-0.68000	0.11410	-0.12700	0.0
351.00	-0.58600	0.08380	-0.13000	-0.00036
352.00	-0.47000	0.05680	-0.13000	-0.00072
354.00	-0.20500	0.03550	-0.12700	-0.00149
355.00	-0.07000	0.02890	-0.12400	-0.00185
356.00	0.06300	0.02350	-0.12200	-0.00221
358.00	0.33000	0.01980	-0.11600	-0.00298
360.00	0.60000	0.01820	-0.11000	-0.00370

TABLE XXXII - Continued

MACH NUMBER = 0.80 SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.36200	0.05220	-0.09600	-0.00117
1.00	0.41000	0.06140	-0.10100	-0.00162
2.00	0.45000	0.07800	-0.10600	-0.00203
3.00	0.49000	0.10300	-0.11200	-0.00244
4.00	0.52900	0.13200	-0.11600	-0.00280
5.00	0.56800	0.15630	-0.11900	-0.00316
6.00	0.60000	0.18080	-0.12100	-0.00348
7.00	0.63000	0.20650	-0.12500	-0.00384
8.00	0.66200	0.22950	-0.12800	-0.00411
9.00	0.69200	0.25050	-0.13700	-0.00447
10.00	0.72100	0.26920	-0.14900	-0.00474
11.00	0.75000	0.28830	-0.16000	-0.00501
12.00	0.77900	0.30650	-0.17100	-0.00528
13.00	0.80100	0.32400	-0.18200	-0.00560
14.00	0.82800	0.34200	-0.19200	-0.00587
16.00	0.87200	0.37350	-0.21200	-0.00641
20.00	0.95000	0.39400	-0.24500	-0.00741
30.00	1.07000	0.75000	-0.28700	-0.00975
50.00	1.20000	1.51000	-0.42200	-0.01330
65.00	0.85000	1.94000	-0.50700	-0.01600
80.00	0.41400	2.21500	-0.57300	-0.01780
90.00	0.10000	2.28000	-0.60700	-0.01810
100.00	-0.22000	2.26200	-0.63000	-0.01760
110.00	-0.52000	2.15400	-0.64000	-0.01650
130.00	-0.95500	1.66800	-0.60000	-0.01260
162.00	-0.54000	0.46000	-0.25000	-0.00450
170.00	-0.78000	0.22800	-0.16300	-0.00200
175.00	-0.52000	0.09800	-0.07900	-0.00030
180.00	-0.10000	0.03000	0.01000	0.00120
186.00	0.40000	0.06800	0.11500	0.00290
192.00	0.77000	0.21000	0.21500	0.00450
200.00	0.64000	0.43300	0.33200	0.00650
230.00	0.98000	1.60000	0.63200	0.01320
260.00	0.26000	2.24000	0.65000	0.01760
270.00	-0.05000	2.28000	0.62000	0.01810
280.00	-0.37000	2.22800	0.58000	0.01770
300.00	-0.92000	1.89600	0.47800	0.01520
330.00	-0.96000	0.85000	0.25700	0.00970
345.00	-0.60500	0.32000	0.06200	0.00551
348.00	-0.50200	0.16480	0.01600	0.00456
349.00	-0.46300	0.14680	-0.00200	0.00420
350.00	-0.42400	0.15000	-0.01600	0.00379
351.00	-0.38300	0.11530	-0.02800	0.00339
352.00	-0.34000	0.10000	-0.04000	0.00298
354.00	-0.22800	0.07600	-0.06200	0.00208
355.00	-0.14300	0.06680	-0.07300	0.00153
356.00	0.04500	0.05900	-0.08100	0.00095
358.00	0.26200	0.04900	-0.08600	-0.00022
360.00	0.36200	0.05220	-0.09600	-0.00117

TABLE XXXIII. AERODYNAMIC COEFFICIENT DATA FOR THE KAMAN 23012 AIRFOIL SECTION WITH A FAIRED FLAP

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.33200	0.00635	0.07700	0.00285
2.00	-0.12000	0.00625	0.08030	0.00230
3.00	-0.00900	0.00615	0.08200	0.00203
4.00	0.10000	0.00615	0.08370	0.00176
5.00	0.21000	0.00625	0.08500	0.00149
6.00	0.31500	0.00645	0.08600	0.00117
7.00	0.42500	0.00845	0.08650	0.00090
8.00	0.53300	0.01045	0.08730	0.00063
9.00	0.64200	0.01395	0.08750	0.00036
10.00	0.75000	0.01895	0.08720	0.00009
11.00	0.86000	0.02745	0.08620	-0.00023
12.00	0.96000	0.03795	0.08540	-0.00050
14.00	1.11000	0.07145	0.06900	-0.00104
16.00	0.94200	0.13795	0.03500	-0.00154
20.00	0.91800	0.20245	-0.01150	-0.00230
30.00	1.01000	0.56745	-0.15900	-0.00592
50.00	1.20000	1.29245	-0.34000	-0.01152
65.00	0.85000	1.69245	-0.43800	-0.01423
80.00	0.41400	1.92745	-0.51000	-0.01775
90.00	0.10000	1.98745	-0.54000	-0.01581
100.00	-0.22000	1.96245	-0.56000	-0.01535
110.00	-0.52000	1.85945	-0.56400	-0.01432
130.00	-0.95500	1.65245	-0.54200	-0.01129
162.00	-0.54000	0.34745	-0.30000	-0.00406
170.00	-0.78000	0.19245	-0.34000	-0.00203
175.00	-0.52000	0.07945	-0.30000	-0.00068
180.00	-0.10000	0.03745	0.0	0.00058
189.00	0.40000	0.09245	0.38200	0.00271
192.00	0.77000	0.15745	0.34800	0.00339
200.00	0.64000	0.29745	0.32000	0.00497
230.00	0.98000	1.38245	0.58000	0.01075
260.00	0.26000	1.96245	0.57600	0.01535
270.00	-0.05000	2.00745	0.54300	0.01633
280.00	-0.37000	1.97745	0.50000	0.01581
300.00	-0.92000	1.68245	0.39000	0.01377
330.00	-0.96000	0.71245	0.14000	0.01016
345.00	-1.26100	0.24245	0.07100	0.00682
348.00	-1.30800	0.14145	0.06100	0.00610
349.00	-1.29100	0.10345	0.05900	0.00583
350.00	-1.26400	0.07545	0.05800	0.00555
351.00	-1.21800	0.05145	0.05900	0.00537
352.00	-1.15500	0.03145	0.06000	0.00504
353.00	-1.07500	0.01995	0.06100	0.00479
354.00	-0.98500	0.01495	0.06320	0.00452
355.00	-0.88000	0.01065	0.06600	0.00425
356.00	-0.77000	0.00895	0.06800	0.00397
357.00	-0.65800	0.00745	0.07000	0.00370
358.00	-0.55300	0.00705	0.07200	0.00343
360.00	-0.33200	0.00635	0.07700	0.00285

TABLE XXXIII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.31500	0.00628	0.07950	0.00339
2.00	-0.07100	0.00608	0.08200	0.00280
3.00	0.05000	0.00618	0.08350	0.00253
4.00	0.17000	0.00628	0.08500	0.00221
5.00	0.29200	0.00728	0.08550	0.00194
6.00	0.41500	0.00808	0.08590	0.00163
7.00	0.53400	0.00928	0.08600	0.00131
8.00	0.65400	0.01048	0.08600	0.00104
9.00	0.77600	0.01228	0.08600	0.00081
10.00	0.89000	0.01678	0.08440	0.00045
11.00	0.97800	0.02428	0.08200	0.00014
12.00	0.99000	0.03728	0.06600	-0.00018
14.00	0.93800	0.10728	0.00600	-0.00077
16.00	0.90000	0.13028	-0.02200	-0.00140
20.00	0.95000	0.29728	-0.05600	-0.00262
30.00	1.08000	0.60728	-0.15300	-0.00560
50.00	1.20000	1.40228	-0.36000	-0.01197
65.00	0.85000	1.79728	-0.45200	-0.01445
80.00	0.41400	1.99928	-0.52200	-0.01594
90.00	0.10000	2.04528	-0.55400	-0.01626
100.00	-0.22000	2.00228	-0.57500	-0.01581
110.00	-0.52000	1.68728	-0.58100	-0.01468
130.00	-0.95500	1.49228	-0.55500	-0.01138
162.00	-0.54000	0.35728	-0.29000	-0.00411
170.00	-0.78000	0.20228	-0.30200	-0.00293
175.00	-0.52000	0.09728	-0.26500	-0.00058
180.00	-0.10000	0.04728	0.0	0.00077
189.00	0.40000	0.10728	0.34800	0.00294
192.00	0.77000	0.15728	0.33200	0.00334
200.00	0.64000	0.33728	0.32800	0.00542
230.00	0.58000	1.45228	0.59000	0.01124
260.00	0.26000	2.00728	0.59200	0.01563
270.00	-0.05000	2.06728	0.56000	0.01630
280.00	-0.37000	2.05528	0.51200	0.01603
300.00	-0.92000	1.77728	0.40000	0.01400
330.00	-1.04100	0.78728	0.19900	0.01034
345.00	-1.08000	0.28728	0.13630	0.00763
348.00	-1.23700	0.19728	0.09750	0.00686
349.00	-1.24700	0.16128	0.08900	0.00659
350.00	-1.24300	0.12428	0.07200	0.00632
351.00	-1.21000	0.08428	0.06600	0.00610
352.00	-1.15700	0.05728	0.06450	0.00578
353.00	-1.08500	0.03728	0.06540	0.00546
354.00	-1.00000	0.02378	0.06650	0.00519
355.00	-0.90000	0.01478	0.06930	0.00492
356.00	-0.80000	0.00978	0.07160	0.00461
357.00	-0.67500	0.00828	0.07360	0.00429
358.00	-0.55600	0.00688	0.07600	0.00402
360.00	-0.31500	0.00628	0.07950	0.00339

TABLE XXXIII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.26500	0.00730	0.07500	0.00461
2.00	0.0	0.00740	0.08600	0.00388
3.00	0.13000	0.00760	0.09100	0.00352
4.00	0.26500	0.00780	0.09600	0.00316
5.00	0.43000	0.00830	0.10100	0.00280
6.00	0.52300	0.01030	0.10500	0.00239
7.00	0.62000	0.01380	0.10700	0.00199
8.00	0.70300	0.02080	0.10800	0.00163
9.00	0.76000	0.02930	0.10400	0.00117
10.00	0.80000	0.03980	0.08100	0.00077
11.00	0.82800	0.05330	0.04300	0.00036
12.00	0.85000	0.07080	0.01000	-0.00009
14.00	0.88000	0.12680	-0.02300	-0.00095
16.00	0.90500	0.18430	-0.04700	-0.00191
20.00	0.94700	0.31680	-0.08400	-0.00348
30.00	1.03000	0.67680	-0.23200	-0.00718
50.00	1.20000	1.48680	-0.39100	-0.01233
65.00	0.85000	1.88180	-0.47700	-0.01495
80.00	0.41400	2.09680	-0.54000	-0.01671
90.00	0.10000	2.14680	-0.57000	-0.01721
100.00	-0.22000	2.10180	-0.59000	-0.01675
110.00	-0.52000	1.99180	-0.60100	-0.01558
130.00	-0.95500	1.58180	-0.57300	-0.01197
162.00	-0.54000	0.42680	-0.28000	-0.00429
170.00	-0.78000	0.22680	-0.27300	-0.00203
175.00	-0.52000	0.11680	-0.21000	-0.00045
180.00	-0.10000	0.03680	0.0	0.00108
189.00	0.40000	0.17180	0.28000	0.00316
192.00	0.77000	0.20680	0.30900	0.00384
200.00	0.64000	0.39680	0.32500	0.00564
230.00	0.98000	1.54680	0.61000	0.01152
260.00	0.26000	2.10680	0.62800	0.01188
270.00	-0.05000	2.17180	0.59200	0.01269
280.00	-0.37000	2.15890	0.55000	0.01680
300.00	-0.92000	1.88480	0.44500	0.01441
330.00	-1.08500	0.85680	0.21200	0.01016
345.00	-0.93500	0.34680	0.11300	0.00854
348.00	-0.90000	0.26680	0.09900	0.00804
349.00	-0.89000	0.23180	0.09300	0.00786
350.00	-0.87700	0.21180	0.09000	0.00768
351.00	-0.86200	0.18980	0.08600	0.00745
352.00	-0.85000	0.16430	0.08400	0.00723
353.00	-0.83700	0.13180	0.08200	0.00700
354.00	-0.81200	0.09880	0.08000	0.00673
355.00	-0.76500	0.06280	0.07000	0.00646
356.00	-0.69800	0.02880	0.06300	0.00614
357.00	-0.61000	0.00930	0.06000	0.00574
358.00	-0.51000	0.00760	0.06400	0.00533
360.00	-0.26500	0.00730	0.07500	0.00461

TABLE XXXIII - Continued

MACH NUMBER = 0.80 SERVO-FLAP DEFLECTION =-10.0 DEG

ALPHA	CL	CD	CM	CMO
0.0	-0.28600	0.08794	0.06350	0.00271
2.00	0.0	0.05794	0.05800	0.00149
3.00	0.17000	0.04894	0.05100	0.00063
4.00	0.24000	0.04344	0.02800	-0.00009
5.00	0.29100	0.04114	0.01300	-0.00072
6.00	0.34200	0.04244	0.00200	-0.00126
7.00	0.39200	0.04594	-0.00600	-0.00176
8.00	0.44000	0.05194	-0.01200	-0.00221
9.00	0.48500	0.06094	-0.02000	-0.00256
10.00	0.52700	0.07094	-0.02600	-0.00307
11.00	0.56800	0.08494	-0.03300	-0.00348
12.00	0.60800	0.09844	-0.03900	-0.00384
14.00	0.68000	0.12994	-0.07400	-0.00447
16.00	0.74800	0.17194	-0.12900	-0.00515
20.00	0.85000	0.27094	-0.20800	-0.00632
30.00	1.01000	0.65594	-0.28700	-0.00874
50.00	1.20000	1.42594	-0.42200	-0.01332
65.00	0.85000	1.89094	-0.50800	-0.01603
80.00	0.41400	2.19094	-0.57200	-0.01744
90.00	0.10000	2.26094	-0.60900	-0.01811
100.00	-0.22000	2.23594	-0.62300	-0.01761
110.00	-0.52000	2.13594	-0.63800	-0.01648
130.00	-0.95500	1.69594	-0.53900	-0.01264
162.00	-0.94000	0.51594	-0.28000	-0.00438
170.00	-0.78000	0.27094	-0.17200	-0.00293
175.00	-0.52000	0.14594	-0.08200	-0.00027
180.00	-0.10000	0.06094	0.0	0.00121
189.00	0.40000	0.18594	0.16200	0.00346
192.00	0.77000	0.25594	0.21200	0.00432
200.00	0.64000	0.50594	0.34000	0.00555
230.00	0.59000	1.65594	0.63000	0.01319
260.00	0.26000	2.25094	0.65100	0.01761
270.00	-0.05000	2.29594	0.61300	0.01936
280.00	-0.37000	2.25194	0.58000	0.01770
300.00	-0.92000	1.92094	0.47800	0.01517
330.00	-1.02000	0.94594	0.25600	0.01021
345.00	-0.72000	0.43094	0.13400	0.00704
348.00	-0.64700	0.33594	0.11500	0.00628
349.00	-0.62000	0.31594	0.10900	0.00596
350.00	-0.59600	0.29094	0.10300	0.00574
351.00	-0.57100	0.26594	0.09700	0.00546
352.00	-0.54800	0.24494	0.09200	0.00519
353.00	-0.52100	0.22194	0.08700	0.00492
354.00	-0.49800	0.19994	0.08300	0.00465
355.00	-0.47000	0.17844	0.07900	0.00434
356.00	-0.44100	0.15994	0.07700	0.00406
357.00	-0.41000	0.13994	0.07100	0.00375
358.00	-0.37200	0.12344	0.06900	0.00343
360.00	-0.28600	0.08794	0.06350	0.00271

TABLE XXXIII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.12000	0.00615	0.03470	0.00163
2.00	0.11200	0.00605	0.03600	0.00104
3.00	0.22000	0.00595	0.03700	0.00077
4.00	0.32500	0.00605	0.03740	0.00050
5.00	0.43200	0.00625	0.03780	0.00023
6.00	0.54000	0.00735	0.03750	-0.00005
7.00	0.65000	0.00915	0.03720	-0.00032
8.00	0.75000	0.01115	0.03630	-0.00063
9.00	0.86000	0.01595	0.03600	-0.00090
10.00	0.96900	0.02245	0.03430	-0.00117
11.00	1.07000	0.03145	0.03510	-0.00145
12.00	1.17000	0.04445	0.03100	-0.00172
14.00	1.12100	0.07745	0.00900	-0.00226
16.00	0.96200	0.15045	-0.02470	-0.00280
20.00	0.93100	0.28945	-0.05500	-0.00402
30.00	1.01000	0.57945	-0.15900	-0.00677
50.00	1.20000	1.30545	-0.34000	-0.01152
65.00	0.85000	1.70245	-0.43800	-0.01423
80.00	0.41400	1.93545	-0.51000	-0.01775
90.00	0.10000	1.99245	-0.54000	-0.01581
100.00	-0.22000	1.96745	-0.56000	-0.01535
110.00	-0.52000	1.86645	-0.56400	-0.01432
130.00	-0.95500	1.44145	-0.54200	-0.01129
162.00	-0.54000	0.33445	-0.31000	-0.00406
170.00	-0.78000	0.18745	-0.34000	-0.00203
175.00	-0.52000	0.06845	-0.30000	-0.00068
180.00	-0.10000	0.02545	0.0	0.00068
189.00	0.40000	0.07945	0.38200	0.00271
192.00	0.77000	0.15695	0.34300	0.00339
200.00	0.64000	0.28745	0.32000	0.00497
230.00	0.98000	1.37245	0.58000	0.01075
260.00	0.26000	1.95745	0.57600	0.01535
270.00	-0.05000	2.00245	0.54300	0.01603
280.00	-0.37000	1.97245	0.50000	0.01581
300.00	-0.92000	1.67245	0.39000	0.01377
330.00	-0.96000	0.69845	0.14000	0.00717
345.00	-1.21000	0.23545	0.03840	0.00560
348.00	-1.20500	0.12945	0.02750	0.00483
349.00	-1.17200	0.0[illegible]45	0.02600	0.00455
350.00	-1.12000	0.0[illegible]45	0.02600	0.00434
351.00	-1.15000	0.04645	0.02600	0.00406
352.00	-0.96300	0.02845	0.02700	0.00379
353.00	-0.85800	0.01945	0.02800	0.00357
354.00	-0.75000	0.01445	0.02950	0.00325
355.00	-0.64500	0.00995	0.03000	0.00298
356.00	-0.53600	0.00845	0.03100	0.00271
357.00	-0.42700	0.00705	0.03200	0.00244
358.00	-0.32000	0.00655	0.03350	0.00217
360.00	-0.12000	0.00615	0.03470	0.00163

TABLE XXXIII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.90000	0.00598	0.03360	0.00190
2.00	0.15400	0.00588	0.03640	0.00131
3.00	0.27600	0.00588	0.03780	0.00099
4.00	0.40000	0.00608	0.03850	0.00072
5.00	0.51800	0.00688	0.03950	0.00041
6.00	0.63700	0.00828	0.04700	0.00014
7.00	0.76300	0.01028	0.04040	-0.00018
8.00	0.88000	0.01478	0.04060	-0.00050
9.00	0.99500	0.01608	0.04030	-0.00081
10.00	1.09000	0.02228	0.04020	-0.00108
11.00	1.14000	0.02828	0.04000	-0.00135
12.00	1.08000	0.04378	0.02500	-0.00167
14.00	0.96000	0.12178	-0.05300	-0.00230
16.00	0.93000	0.19628	-0.07270	-0.00299
20.00	0.95000	0.30723	-0.09040	-0.00402
30.00	1.03000	0.62423	-0.13100	-0.00573
50.00	1.20000	1.41023	-0.36000	-0.01197
65.00	0.85000	1.79728	-0.45200	-0.01445
80.00	0.41400	2.00228	-0.52300	-0.01594
90.00	0.10000	2.04528	-0.55400	-0.01626
100.00	-0.22000	2.09428	-0.57500	-0.01581
110.00	-0.52000	1.89228	-0.53100	-0.01468
130.00	-0.95500	1.48528	-0.55600	-0.01139
167.00	-0.54000	0.33228	-0.29000	-0.00411
170.00	-0.79000	0.19723	-0.30200	-0.00293
175.00	-0.52000	0.08728	-0.25500	-0.00068
180.00	-0.10000	0.03028	0.0	0.00077
189.00	0.40000	0.10028	0.34800	0.00294
192.00	0.77000	0.17728	0.33700	0.00384
200.00	0.64000	0.31928	0.32800	0.00542
230.00	0.94000	1.43728	0.59000	0.01124
260.00	0.26000	1.99228	0.59200	0.01563
270.00	-0.05000	2.06228	0.56000	0.01630
280.00	-0.37000	2.05228	0.51200	0.01693
300.00	-0.92000	1.76728	0.43000	0.01400
330.00	-1.03000	0.77028	0.17800	0.00944
345.00	-1.04000	0.27228	0.07200	0.00619
348.00	-1.19300	0.17928	0.05000	0.00537
349.00	-1.18000	0.14128	0.02950	0.00510
350.00	-1.14600	0.10528	0.02130	0.00483
351.00	-1.08900	0.07128	0.01970	0.00456
352.00	-1.01000	0.04728	0.01930	0.00429
353.00	-0.91500	0.03228	0.02000	0.00397
354.00	-0.81000	0.02043	0.02100	0.00366
355.00	-0.69000	0.01308	0.02300	0.00339
356.00	-0.56500	0.00928	0.02550	0.00312
357.00	-0.44500	0.00828	0.02750	0.00280
358.00	-0.32500	0.00658	0.03000	0.00248
360.00	-0.09000	0.00608	0.03360	0.00190

TABLE XXXIII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.05000	0.00590	0.03300	0.00253
2.00	0.20500	0.00610	0.04200	0.00181
3.00	0.34000	0.00610	0.04600	0.00145
4.00	0.47000	0.00650	0.05000	0.00108
5.00	0.60000	0.00730	0.05200	0.00068
6.00	0.69300	0.00980	0.05300	0.00027
7.00	0.75000	0.01480	0.05100	-0.00014
8.00	0.78800	0.02280	0.04500	-0.00054
9.00	0.81200	0.03180	0.02500	-0.00090
10.00	0.83300	0.04530	0.00200	-0.00131
11.00	0.85100	0.06180	-0.01500	-0.00167
12.00	0.86800	0.08480	-0.03100	-0.00208
14.00	0.89200	0.15480	-0.05600	-0.00290
16.00	0.91600	0.20980	-0.07500	-0.00348
20.00	0.95900	0.34430	-0.10500	-0.00479
30.00	1.04100	0.69180	-0.24000	-0.00772
50.00	1.20000	1.49980	-0.39100	-0.01233
65.00	0.85000	1.98980	-0.47700	-0.01495
80.00	0.41400	2.10690	-0.54000	-0.01671
90.00	0.10000	2.15180	-0.57000	-0.01721
100.00	-0.22000	2.10680	-0.59000	-0.01675
110.00	-0.52000	1.99380	-0.60100	-0.01558
130.00	-0.95500	1.57630	-0.57800	-0.01197
162.00	-0.54000	0.41180	-0.28000	-0.00429
170.00	-0.76000	0.21680	-0.27300	-0.00203
175.00	-0.52000	0.10430	-0.21000	-0.00045
180.00	-0.10000	0.02580	0.0	0.00108
189.00	0.40000	0.14930	0.28000	0.00316
192.00	0.77000	0.19680	0.33900	0.00384
200.00	0.64000	0.37180	0.32500	0.00564
230.00	0.98000	1.53180	0.61000	0.01152
260.00	0.26000	2.09680	0.62800	0.01188
270.00	-0.05000	2.16490	0.59200	0.01269
280.00	-0.37000	2.14780	0.55000	0.01680
300.00	-0.92000	1.87380	0.44500	0.01441
330.00	-1.07700	0.82180	0.20900	0.00948
345.00	-0.92000	0.32180	0.08900	0.00691
348.00	-0.88000	0.22480	0.07200	0.00623
349.00	-0.86700	0.20890	0.06900	0.00605
350.00	-0.85200	0.18630	0.06400	0.00583
351.00	-0.83800	0.15980	0.05900	0.00555
352.00	-0.82000	0.12480	0.05000	0.00528
353.00	-0.80000	0.08480	0.04400	0.00501
354.00	-0.75200	0.03780	0.03400	0.00470
355.00	-0.68000	0.01080	0.02000	0.00438
356.00	-0.53000	0.00770	0.01600	0.00406
357.00	-0.45400	0.00680	0.02000	0.00370
358.00	-0.32000	0.00630	0.02400	0.00330
360.00	-0.05000	0.00590	0.03300	0.00253

TABLE XXXIII - Continued

MACH NUMBER = 0.80 SERVO-FLAP DEFLECTION = -5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	-0.08500	0.04794	0.03000	0.00172
2.00	0.19000	0.02594	0.02200	0.00050
3.00	0.25200	0.02294	0.00500	-0.00023
4.00	0.30300	0.02444	-0.00500	-0.00077
5.00	0.35200	0.02944	-0.01400	-0.00122
6.00	0.40000	0.03844	-0.02100	-0.00167
7.00	0.44100	0.05294	-0.02700	-0.00217
8.00	0.48500	0.06594	-0.03300	-0.00253
9.00	0.52700	0.08194	-0.03800	-0.00294
10.00	0.56800	0.09794	-0.04300	-0.00330
11.00	0.60500	0.11594	-0.04700	-0.00366
12.00	0.64000	0.13594	-0.05500	-0.00402
14.00	0.71000	0.17694	-0.09700	-0.00465
16.00	0.77000	0.22394	-0.14300	-0.00533
20.00	0.86800	0.32894	-0.21400	-0.00646
30.00	1.02000	0.70094	-0.28700	-0.00912
50.00	1.20000	1.47094	-0.42200	-0.01332
65.00	0.85000	1.91894	-0.50800	-0.01603
80.00	0.41400	2.19794	-0.57200	-0.01784
90.00	0.10000	2.26894	-0.60900	-0.01811
100.00	-0.22000	2.24594	-0.62300	-0.01761
110.00	-0.52000	2.14094	-0.63300	-0.01648
130.00	-0.95500	1.68094	-0.50900	-0.01264
162.00	-0.54000	0.48594	-0.23000	-0.00438
170.00	-0.78000	0.24394	-0.17200	-0.00293
175.00	-0.52000	0.11594	-0.08900	-0.00027
180.00	-0.10000	0.04294	0.0	0.00131
189.00	0.40000	0.16594	0.16200	0.00356
192.00	0.77000	0.24094	0.21200	0.00452
200.00	0.64000	0.46594	0.34000	0.00655
230.00	0.98000	1.62594	0.63000	0.01319
260.00	0.26000	2.24394	0.65100	0.01761
270.00	-0.05000	2.28894	0.61800	0.01806
280.00	-0.37000	2.23894	0.58000	0.01770
300.00	-0.92000	1.91294	0.47800	0.01517
330.00	-1.01000	0.90094	0.25600	0.00994
345.00	-0.70000	0.37394	0.12300	0.00650
348.00	-0.62000	0.29494	0.10000	0.00574
349.00	-0.59000	0.27094	0.09400	0.00542
350.00	-0.56300	0.24894	0.08700	0.00515
351.00	-0.53200	0.22694	0.08100	0.00488
352.00	-0.50200	0.20494	0.07400	0.00461
353.00	-0.47200	0.18294	0.06800	0.00434
354.00	-0.44300	0.16094	0.06300	0.00402
355.00	-0.41500	0.13694	0.05800	0.00370
356.00	-0.39000	0.11944	0.05300	0.00339
357.00	-0.34000	0.10094	0.04900	0.00303
358.00	-0.29400	0.08194	0.04200	0.00266
360.00	-0.08500	0.04794	0.03000	0.00172

TABLE XXXIII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.12000	0.00605	-0.00900	0.00036
2.00	0.33600	0.00595	-0.00820	-0.00018
3.00	0.44700	0.00615	-0.00800	-0.00045
4.00	0.55600	0.00625	-0.00800	-0.00072
5.00	0.66500	0.00655	-0.00800	-0.00104
6.00	0.77200	0.00765	-0.00770	-0.00131
7.00	0.88200	0.00955	-0.00770	-0.00158
8.00	0.99000	0.01245	-0.00800	-0.00185
9.00	1.09800	0.01845	-0.00820	-0.00212
10.00	1.20600	0.02695	-0.01000	-0.00239
11.00	1.31400	0.03745	-0.01200	-0.00266
12.00	1.39000	0.04895	-0.01620	-0.00294
14.00	1.07900	0.08545	-0.04600	-0.00348
16.00	0.94300	0.17345	-0.07900	-0.00402
20.00	0.95000	0.29745	-0.10200	-0.00506
30.00	1.01000	0.59245	-0.15900	-0.00750
50.00	1.20000	1.31745	-0.34000	-0.01152
65.00	0.85000	1.71245	-0.43900	-0.01423
80.00	0.41400	1.94345	-0.51000	-0.01775
90.00	0.10000	1.99745	-0.54000	-0.01581
100.00	-0.22000	1.97245	-0.56000	-0.01535
110.00	-0.52000	1.87345	-0.56400	-0.01432
130.00	-0.95500	1.43045	-0.54200	-0.01129
162.00	-0.54000	0.32245	-0.30000	-0.00406
170.00	-0.78000	0.18245	-0.34000	-0.00203
175.00	-0.52000	0.05745	-0.31000	-0.00068
180.00	-0.10000	0.01245	0.0	0.00068
185.00	0.40000	0.06645	0.38200	0.00271
192.00	0.77000	0.15645	0.34800	0.00339
200.00	0.64000	0.27745	0.32000	0.00497
230.00	0.98000	1.36245	0.58000	0.01075
260.00	0.26000	1.95245	0.57600	0.01535
270.00	-0.05000	1.99745	0.54300	0.01603
280.00	-0.37000	1.96745	0.51000	0.01581
300.00	-0.92000	1.66245	0.39000	0.01377
330.00	-0.96000	0.68545	0.14000	0.00817
345.00	-1.12700	0.22745	0.00200	0.00447
348.00	-1.07800	0.12745	-0.00800	0.00366
349.00	-1.02600	0.08845	-0.00850	0.00339
350.00	-0.95000	0.06245	-0.01000	0.00312
351.00	-0.86200	0.04045	-0.01000	0.00285
352.00	-0.75600	0.02545	-0.01050	0.00257
353.00	-0.64800	0.01745	-0.01100	0.00230
354.00	-0.53700	0.01245	-0.01100	0.00203
355.00	-0.42600	0.00945	-0.01050	0.00176
356.00	-0.31800	0.00845	-0.01020	0.00149
357.00	-0.20700	0.00705	-0.01000	0.00122
358.00	-0.10000	0.00645	-0.01000	0.00090
360.00	0.12000	0.00605	-0.00900	0.00036

TABLE XXXIII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.11500	0.00588	-0.01300	0.00045
2.00	0.36000	0.00578	-0.01050	-0.00018
3.00	0.48000	0.00608	-0.00950	-0.00050
4.00	0.60000	0.00628	-0.00800	-0.00077
5.00	0.72300	0.00728	-0.00700	-0.00104
6.00	0.84400	0.00828	-0.00550	-0.00135
7.00	0.96500	0.01118	-0.00400	-0.00167
8.00	1.06500	0.01428	-0.00200	-0.00194
9.00	1.18000	0.01888	0.0	-0.00221
10.00	1.24000	0.02478	0.00300	-0.00253
11.00	1.20000	0.03518	0.00600	-0.00285
12.00	1.11000	0.05328	-0.05700	-0.00312
14.00	0.98800	0.13228	-0.08150	-0.00375
16.00	0.95500	0.20628	-0.08800	-0.00434
20.00	0.95000	0.31728	-0.10750	-0.00542
30.00	1.03000	0.64228	-0.20000	-0.00781
50.00	1.20000	1.41728	-0.36000	-0.01197
65.00	0.85000	1.79728	-0.45200	-0.01445
80.00	0.41400	2.00728	-0.52200	-0.01594
90.00	0.10000	2.05228	-0.55400	-0.01626
100.00	-0.22000	2.00728	-0.57500	-0.01531
110.00	-0.52000	1.89728	-0.58100	-0.01468
130.00	-0.95500	1.47728	-0.55600	-0.01138
162.00	-0.54000	0.30728	-0.29000	-0.00411
170.00	-0.78000	0.19228	-0.30200	-0.00203
175.00	-0.52000	0.07728	-0.26500	-0.00068
180.00	-0.10000	0.01328	0.0	0.00077
189.00	0.40000	0.09228	0.34800	0.00294
192.00	0.77000	0.16728	0.33200	0.00384
200.00	0.64000	0.30228	0.32300	0.00542
230.00	0.98000	1.42228	0.59000	0.01124
260.00	0.26000	1.98728	0.59700	0.01563
270.00	-0.05000	2.05728	0.56000	0.01630
280.00	-0.37000	2.04728	0.51200	0.01603
300.00	-0.92000	1.75728	0.40000	0.01400
330.00	-1.01500	0.75228	0.15600	0.00854
345.00	-1.02000	0.25728	0.02000	0.00483
348.00	-1.11500	0.16028	-0.01600	0.00397
349.00	-1.07000	0.12228	-0.02100	0.00370
350.00	-1.01000	0.08628	-0.02060	0.00339
351.00	-0.93000	0.05728	-0.02000	0.00312
352.00	-0.83700	0.03828	-0.01980	0.00280
353.00	-0.73000	0.02678	-0.01900	0.00248
354.00	-0.60500	0.01728	-0.01800	0.00221
355.00	-0.48500	0.01128	-0.01750	0.00190
356.00	-0.36500	0.00688	-0.01650	0.00163
357.00	-0.24200	0.00828	-0.01600	0.00131
358.00	-0.12300	0.00628	-0.01500	0.00104
360.00	0.11500	0.00598	-0.01300	0.00045

TABLE XXXIII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.14000	0.00580	-0.00800	0.00050
2.00	0.40000	0.00600	0.00100	-0.00027
3.00	0.54000	0.00630	0.00400	-0.00063
4.00	0.65000	0.00680	0.00800	-0.00104
5.00	0.72000	0.00740	0.01000	-0.00135
6.00	0.76000	0.01030	0.01000	-0.00172
7.00	0.79000	0.01580	0.00500	-0.00208
8.00	0.81000	0.02680	-0.01000	-0.00239
9.00	0.83000	0.03930	-0.02700	-0.00271
10.00	0.85000	0.05480	-0.04400	-0.00307
11.00	0.86800	0.07880	-0.06100	-0.00339
12.00	0.88200	0.11090	-0.07700	-0.00366
14.00	0.91000	0.18980	-0.09300	-0.00429
16.00	0.93100	0.25680	-0.10400	-0.00488
20.00	0.97000	0.37190	-0.12900	-0.00596
30.00	1.05300	0.70680	-0.24300	-0.00831
50.00	1.20000	1.51180	-0.39100	-0.01233
65.00	0.85000	1.89660	-0.47700	-0.01495
80.00	0.41400	2.11680	-0.54000	-0.01671
90.00	0.10000	2.15680	-0.57000	-0.01721
100.00	-0.22000	2.11180	-0.59000	-0.01675
110.00	-0.52000	1.99680	-0.60100	-0.01558
130.00	-0.95500	1.57180	-0.57800	-0.01197
162.00	-0.54000	0.39680	-0.28000	-0.00429
170.00	-0.78000	0.20680	-0.27300	-0.00203
175.00	-0.52000	0.09180	-0.21000	-0.00045
180.00	-0.10000	0.01480	0.0	0.00108
189.00	0.40000	0.12680	0.28000	0.00316
192.00	0.77000	0.18680	0.30900	0.00394
200.00	0.64000	0.34680	0.32500	0.00564
230.00	0.98000	1.51680	0.61000	0.01152
260.00	0.26000	2.09180	0.62800	0.01138
270.00	-0.05000	2.15680	0.59200	0.01269
280.00	-0.37000	2.13580	0.55000	0.01690
300.00	-0.92000	1.86180	0.44500	0.01441
330.00	-1.05900	0.78680	0.20200	0.00876
345.00	-0.89300	0.29680	0.05900	0.00524
348.00	-0.85000	0.20680	0.03400	0.00443
349.00	-0.83300	0.18080	0.02700	0.00415
350.00	-0.81600	0.14980	0.02000	0.00388
351.00	-0.79800	0.11180	0.01000	0.00361
352.00	-0.77000	0.06580	-0.00600	0.00330
353.00	-0.72200	0.01930	-0.02400	0.00298
354.00	-0.64600	0.01630	-0.03000	0.00271
355.00	-0.53000	0.00840	-0.02900	0.00235
356.00	-0.40000	0.00730	-0.02500	0.00199
357.00	-0.27000	0.00680	-0.02100	0.00163
358.00	-0.14000	0.00640	-0.01600	0.00126
360.00	0.14000	0.00580	-0.00800	0.00050

TABLE XXXIII - Continued

MACH NUMBER = 0.80 SERVC-FLAP DEFLECTION = 0.0 DEG

ALPHA	CL	CD	CM	CMC
0.0	0.14000	0.01794	-0.00900	0.00059
2.00	0.26000	0.01694	-0.01900	-0.00054
3.00	0.31100	0.02194	-0.03000	-0.00104
4.00	0.36500	0.03094	-0.03700	-0.00149
5.00	0.41000	0.04694	-0.04100	-0.00190
6.00	0.45500	0.06294	-0.04700	-0.00239
7.00	0.50000	0.08094	-0.05200	-0.00275
8.00	0.54000	0.09894	-0.05600	-0.00316
9.00	0.58000	0.11794	-0.06000	-0.00352
10.00	0.62000	0.13794	-0.07000	-0.00384
11.00	0.65100	0.15944	-0.08600	-0.00425
12.00	0.68500	0.18094	-0.10700	-0.00452
14.00	0.74800	0.23094	-0.14200	-0.00515
16.00	0.80200	0.28094	-0.17300	-0.00578
20.00	0.89900	0.39594	-0.22500	-0.00695
30.00	1.03900	0.74594	-0.28700	-0.00935
50.00	1.20000	1.51594	-0.42200	-0.01332
65.00	0.85000	1.94594	-0.50800	-0.01603
80.00	0.41400	2.20594	-0.57200	-0.01734
90.00	0.10000	2.27594	-0.60900	-0.01911
100.00	-0.22000	2.25594	-0.62800	-0.01761
110.00	-0.52000	2.14594	-0.63800	-0.01648
130.00	-0.95500	1.66594	-0.50900	-0.01264
162.00	-0.54000	0.45594	-0.28000	-0.00438
170.00	-0.78000	0.21594	-0.17200	-0.00203
175.00	-0.52000	0.08594	-0.08900	-0.00027
180.00	-0.10000	0.02594	0.0	0.00131
189.00	0.40000	0.14594	0.16200	0.00366
192.00	0.77000	0.22594	0.21200	0.00452
200.00	0.64000	0.42594	0.34000	0.00655
230.00	0.93000	1.59594	0.63000	0.01319
260.00	0.26000	2.23594	0.65100	0.01761
270.00	-0.05000	2.28094	0.61800	0.01806
280.00	-0.37000	2.22594	0.53000	0.01770
300.00	-0.92000	1.90594	0.47800	0.01517
330.00	-1.00000	0.85594	0.25600	0.00971
345.00	-0.67000	0.31794	0.10500	0.00610
348.00	-0.58500	0.24094	0.07100	0.00524
349.00	-0.55600	0.21594	0.06100	0.00497
350.00	-0.52200	0.19594	0.05200	0.00455
351.00	-0.49000	0.17394	0.04600	0.00434
352.00	-0.45500	0.15094	0.03900	0.00406
353.00	-0.42800	0.13094	0.03100	0.00375
354.00	-0.37000	0.10894	0.02300	0.00339
355.00	-0.34000	0.08894	0.01700	0.00307
356.00	-0.30000	0.07094	0.01000	0.00271
357.00	-0.24800	0.05394	0.00200	0.00226
358.00	-0.17000	0.03794	-0.00600	0.00176
360.00	0.14000	0.01794	-0.00900	0.00059

TABLE XXXIII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.36800	0.00595	-0.05650	-0.00086
2.00	0.58500	0.00605	-0.05600	-0.00145
3.00	0.69500	0.00625	-0.05600	-0.00172
4.00	0.80300	0.00635	-0.05580	-0.00199
5.00	0.91500	0.00705	-0.05580	-0.00226
6.00	1.02500	0.00915	-0.05550	-0.00253
7.00	1.13800	0.01145	-0.05600	-0.00280
8.00	1.24800	0.01525	-0.05600	-0.00307
9.00	1.35500	0.02155	-0.05630	-0.00334
10.00	1.44400	0.03045	-0.05720	-0.00366
11.00	1.52000	0.04305	-0.05850	-0.00393
12.00	1.52500	0.05745	-0.06700	-0.00420
14.00	1.21000	0.09945	-0.10400	-0.00470
16.00	1.00000	0.19495	-0.13000	-0.00524
20.00	0.97000	0.31145	-0.14370	-0.00623
30.00	1.01000	0.60545	-0.15900	-0.00840
50.00	1.20000	1.32945	-0.34000	-0.01152
65.00	0.85000	1.72045	-0.43800	-0.01423
80.00	0.41400	1.94845	-0.51000	-0.01775
90.00	0.10000	2.00245	-0.54000	-0.01531
100.00	-0.22000	1.97545	-0.56000	-0.01535
110.00	-0.52000	1.87045	-0.56400	-0.01432
130.00	-0.95500	1.42345	-0.54200	-0.01129
162.00	-0.54000	0.30045	-0.33000	-0.00406
170.00	-0.78000	0.16945	-0.34000	-0.00203
175.00	-0.52000	0.06745	-0.30000	-0.00068
180.00	-0.10000	0.02245	0.0	0.00068
189.00	0.40000	0.06495	0.39200	0.00271
192.00	0.77000	0.15045	0.34800	0.00339
200.00	0.64000	0.27045	0.32000	0.00497
230.00	0.98000	1.35045	0.58000	0.01075
260.00	0.26000	1.94545	0.57600	0.01535
270.00	-0.05000	1.99245	0.54300	0.01603
280.00	-0.37000	1.96045	0.50000	0.01531
300.00	-0.92000	1.65545	0.39000	0.01377
330.00	-0.96000	0.67945	0.14000	0.00709
[illegible]5.00	-1.01500	0.21745	-0.03240	0.00321
348.00	-0.90400	0.10545	-0.04600	0.00239
349.00	-0.82800	0.07495	-0.04800	0.00212
350.00	-0.73600	0.05095	-0.05100	0.00185
351.00	-0.63000	0.03345	-0.05200	0.00163
352.00	-0.52000	0.02045	-0.05360	0.00135
353.00	-0.40500	0.01495	-0.05500	0.00108
354.00	-0.30000	0.01095	-0.05600	0.00081
355.00	-0.18700	0.00865	-0.05640	0.00050
356.00	-0.07700	0.00795	-0.05650	0.00027
357.00	0.03500	0.00705	-0.05700	-0.00005
358.00	0.14700	0.00645	-0.05650	-0.00032
360.00	0.36800	0.00595	-0.05650	-0.00086

TABLE XXXIII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.36000	0.00578	-0.05800	-0.00108
2.00	0.60000	0.00588	-0.05700	-0.00157
3.00	0.72000	0.00618	-0.05600	-0.00199
4.00	0.84500	0.00678	-0.05500	-0.00230
5.00	0.97000	0.00828	-0.05600	-0.00260
6.00	1.09200	0.00978	-0.05600	-0.00285
7.00	1.20000	0.01328	-0.05600	-0.00316
8.00	1.29000	0.01828	-0.05700	-0.00348
9.00	1.35000	0.02728	-0.05800	-0.00379
10.00	1.36000	0.04028	-0.07900	-0.00406
11.00	1.24000	0.06228	-0.10500	-0.00434
12.00	1.14500	0.10428	-0.11500	-0.00465
14.00	1.01000	0.17928	-0.12900	-0.00524
16.00	0.97000	0.23128	-0.13800	-0.00578
20.00	0.95000	0.33228	-0.16100	-0.00686
30.00	1.03000	0.65228	-0.23400	-0.00917
50.00	1.20000	1.43028	-0.36000	-0.01197
65.00	0.85000	1.80728	-0.45200	-0.01445
80.00	0.41400	2.01728	-0.52200	-0.01594
90.00	0.10000	2.05728	-0.55400	-0.01626
100.00	-0.22000	2.01728	-0.57500	-0.01581
110.00	-0.52000	1.90628	-0.58100	-0.01468
130.00	-0.95500	1.46728	-0.55600	-0.01138
162.00	-0.54000	0.30228	-0.29000	-0.00411
170.00	-0.78000	0.18228	-0.30200	-0.00203
175.00	-0.52000	0.07728	-0.26500	-0.00068
180.00	-0.10000	0.02028	0.0	0.00077
189.00	0.40000	0.09028	0.34800	0.00294
192.00	0.77000	0.16228	0.33200	0.00384
200.00	0.64000	0.29728	0.32800	0.00542
230.00	0.98000	1.41028	0.59000	0.01124
260.00	0.26000	1.98228	0.59200	0.01563
270.00	-0.05000	2.05028	0.56000	0.01630
280.00	-0.37000	2.03728	0.51200	0.01603
300.00	-0.92000	1.74928	0.40000	0.01400
330.00	-0.97500	0.73728	0.14300	0.00759
345.00	-0.94000	0.24728	-0.02300	0.00339
348.00	-0.91400	0.13828	-0.07400	0.00248
349.00	-0.85500	0.09978	-0.07500	0.00221
350.00	-0.78000	0.06878	-0.07400	0.00190
351.00	-0.69000	0.04878	-0.07300	0.00163
352.00	-0.59000	0.03378	-0.07100	0.00131
353.00	-0.47000	0.02228	-0.06900	0.00099
354.00	-0.35300	0.01478	-0.06700	0.00068
355.00	-0.23200	0.01048	-0.06500	0.00041
356.00	-0.11500	0.00828	-0.06400	0.00009
357.00	0.00500	0.00728	-0.06200	-0.00018
358.00	0.12500	0.00628	-0.06100	-0.00050
360.00	0.36000	0.00578	-0.05800	-0.00108

TABLE XXXIII - Continued

MACH NUMBER = 0.65 SERVC-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.38500	0.00680	-0.05700	-0.00158
2.00	0.63000	0.00760	-0.05000	-0.00235
3.00	0.71000	0.00810	-0.04700	-0.00271
4.00	0.76000	0.00960	-0.05100	-0.00303
5.00	0.78500	0.01400	-0.05900	-0.00339
6.00	0.80800	0.02230	-0.07100	-0.00366
7.00	0.82800	0.03280	-0.08500	-0.00397
8.00	0.84500	0.04730	-0.09600	-0.00420
9.00	0.86000	0.06680	-0.10400	-0.00452
10.00	0.87400	0.09780	-0.11100	-0.00479
11.00	0.88800	0.13280	-0.11900	-0.00501
12.00	0.90000	0.16230	-0.12400	-0.00524
14.00	0.92500	0.21530	-0.13500	-0.00569
16.00	0.94800	0.28680	-0.14700	-0.00619
20.00	0.98300	0.39680	-0.17100	-0.00704
30.00	1.07000	0.72680	-0.25300	-0.00894
50.00	1.20000	1.52480	-0.39100	-0.01233
65.00	0.85000	1.90980	-0.47700	-0.01495
80.00	0.41400	2.12180	-0.54000	-0.01671
90.00	0.10000	2.16480	-0.57000	-0.01721
100.00	-0.22000	2.11980	-0.59000	-0.01675
110.00	-0.52000	2.00180	-0.60100	-0.01558
130.00	-0.95500	1.56480	-0.57800	-0.01197
162.00	-0.54000	0.38480	-0.28000	-0.00429
170.00	-0.78000	0.19430	-0.27300	-0.00203
175.00	-0.52000	0.08930	-0.21000	-0.00045
180.00	-0.10000	0.01880	0.0	0.00108
189.00	0.40000	0.12130	0.28000	0.00316
192.00	0.77000	0.17680	0.30900	0.00384
200.00	0.64000	0.33180	0.32500	0.00564
230.00	0.98000	1.50180	0.61000	0.01152
260.00	0.26000	2.08480	0.62800	0.01138
270.00	-0.05000	2.14980	0.59200	0.01269
280.00	-0.37000	2.12680	0.55000	0.01680
300.00	-0.92000	1.84680	0.44500	0.01441
330.00	-1.04100	0.76480	0.19400	0.00831
345.00	-0.85500	0.26680	0.02400	0.00384
348.00	-0.81000	0.18380	-0.03000	0.00280
349.00	-0.79700	0.15780	-0.04100	0.00244
350.00	-0.77500	0.12480	-0.05700	0.00208
351.00	-0.73000	0.08480	-0.08500	0.00176
352.00	-0.65000	0.03580	-0.09000	0.00140
353.00	-0.54500	0.01380	-0.09700	0.00099
354.00	-0.42000	0.01030	-0.08300	0.00063
355.00	-0.28500	0.00880	-0.07800	0.00023
356.00	-0.15000	0.00780	-0.07400	-0.00014
357.00	-0.02000	0.00740	-0.07000	-0.00050
358.00	0.11500	0.00700	-0.06600	-0.00096
360.00	0.38500	0.00680	-0.05700	-0.00158

TABLE XXXIII - Continued

MACH NUMBER = C.80 SERVC-FLAP DEFLECTION = 5.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.26800	0.02494	-0.06000	-0.00054
2.00	0.37000	0.03794	-0.07800	-0.00154
3.00	0.41700	0.05094	-0.08300	-0.00199
4.00	0.46000	0.06844	-0.08700	-0.00239
5.00	0.50000	0.09394	-0.09100	-0.00280
6.00	0.54000	0.11694	-0.09400	-0.00316
7.00	0.57800	0.13994	-0.09300	-0.00352
8.00	0.61200	0.16094	-0.10000	-0.00388
9.00	0.64700	0.18394	-0.10700	-0.00420
10.00	0.67800	0.20494	-0.11900	-0.00452
11.00	0.70700	0.22594	-0.13200	-0.00483
12.00	0.73700	0.24594	-0.14500	-0.00510
14.00	0.79100	0.28894	-0.17100	-0.00569
16.00	0.84100	0.35294	-0.19500	-0.00623
20.00	0.93700	0.46594	-0.23900	-0.00732
30.00	1.05400	0.83594	-0.28700	-0.00986
50.00	1.20000	1.56594	-0.42200	-0.01332
65.00	0.85000	1.97094	-0.50800	-0.01603
80.00	0.41400	2.22094	-0.57200	-0.01784
90.00	0.10000	2.28594	-0.60900	-0.01811
100.00	-0.22000	2.26394	-0.62800	-0.01761
110.00	-0.52000	2.15094	-0.63800	-0.01648
130.00	-0.95500	1.65094	-0.50900	-0.01264
162.00	-0.54000	1.43094	-0.23000	-0.00438
170.00	-0.78000	0.20594	-0.17200	-0.00203
175.00	-0.52000	0.09194	-0.08900	-0.00027
180.00	-0.10000	0.03594	0.0	0.00131
185.00	0.40000	0.16094	0.16200	0.00366
192.00	0.77000	0.21594	0.21200	0.00452
200.00	0.64000	0.41094	0.34000	0.00655
230.00	0.98000	1.58894	0.63900	0.01319
260.00	0.26000	2.22594	0.65100	0.01761
270.00	-0.05000	2.27094	0.61800	0.01906
280.00	-0.37000	2.21794	0.58000	0.01770
300.00	-0.92000	1.88094	0.47800	0.01517
330.00	-0.94000	0.81094	0.25600	0.00957
345.00	-0.63500	0.26494	0.08300	0.00583
348.00	-0.54000	0.20394	0.04200	0.00492
349.00	-0.50400	0.18594	0.03000	0.00461
350.00	-0.47000	0.16894	0.01900	0.00429
351.00	-0.43500	0.15494	0.00700	0.00388
352.00	-0.39500	0.13394	-0.00300	0.00357
353.00	-0.35600	0.11594	-0.01300	0.00316
354.00	-0.31400	0.09794	-0.02300	0.00271
355.00	-0.26200	0.07794	-0.03200	0.00230
356.00	-0.20500	0.06194	-0.04000	0.00181
357.00	-0.10000	0.04594	-0.04800	0.00126
358.00	0.10000	0.03494	-0.05200	0.00065
360.00	0.26800	0.02494	-0.06000	-0.00054

TABLE XXXIII - Continued

MACH NUMBER = 0.30 SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.62700	0.00615	-0.10400	-0.00208
2.00	0.83200	0.00635	-0.10300	-0.00266
3.00	0.94400	0.00655	-0.10280	-0.00294
4.00	1.05100	0.00735	-0.10230	-0.00321
5.00	1.16400	0.00845	-0.10230	-0.00348
6.00	1.27500	0.01065	-0.10220	-0.00375
7.00	1.38600	0.01395	-0.10250	-0.00406
8.00	1.46000	0.01795	-0.10370	-0.00434
9.00	1.56300	0.02565	-0.10550	-0.00461
10.00	1.62000	0.03495	-0.10800	-0.00488
11.00	1.58400	0.04745	-0.11400	-0.00515
12.00	1.48900	0.06245	-0.12350	-0.00542
14.00	1.23800	0.11345	-0.14700	-0.00592
16.00	1.05700	0.21645	-0.16550	-0.00641
20.00	0.99500	0.32545	-0.18000	-0.00741
30.00	1.01000	0.61845	-0.15900	-0.00939
50.00	1.20000	1.34245	-0.34000	-0.01152
65.00	0.85000	1.72745	-0.43800	-0.01423
80.00	0.41400	1.95345	-0.51000	-0.01775
90.00	0.10000	2.00745	-0.54000	-0.01581
100.00	-0.22000	1.97945	-0.56000	-0.01535
110.00	-0.52000	1.86745	-0.56400	-0.01432
130.00	-0.95500	1.41745	-0.54200	-0.01129
162.00	-0.54000	0.27745	-0.30000	-0.00406
170.00	-0.78000	0.15745	-0.34000	-0.00203
175.00	-0.52000	0.07745	-0.30000	-0.00068
180.00	-0.10000	0.03245	0.0	0.00068
189.00	0.40000	0.06345	0.38200	0.00271
192.00	0.77000	0.14445	0.34800	0.00339
200.00	0.64000	0.26245	0.32000	0.00497
230.00	0.98000	1.33745	0.58000	0.01075
260.00	0.26000	1.93745	0.57600	0.01535
270.00	-0.05000	1.98745	0.54300	0.01603
280.00	-0.37000	1.95245	0.51000	0.01581
300.00	-0.92000	1.64745	0.39000	0.01377
330.00	-0.96000	0.67245	0.14000	0.00614
345.00	-0.85300	0.20745	-0.07680	0.00203
348.00	-0.70700	0.09545	-0.09400	0.00117
349.00	-0.60500	0.06745	-0.09620	0.00090
350.00	-0.49800	0.04245	-0.09830	0.00068
351.00	-0.38500	0.02745	-0.10000	0.00041
352.00	-0.27500	0.01845	-0.10140	0.00009
353.00	-0.16500	0.01345	-0.10200	-0.00018
354.00	-0.05800	0.00895	-0.10350	-0.00045
355.00	0.05700	0.00795	-0.10400	-0.00072
356.00	0.17000	0.00745	-0.10400	-0.00099
357.00	0.28300	0.00705	-0.10400	-0.00126
358.00	0.39500	0.00665	-0.10400	-0.00154
360.00	0.62700	0.00615	-0.10400	-0.00208

TABLE XXXIII - Continued

MACH NUMBER = 0.45 SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.59500	0.00598	-0.10700	-0.00253
2.00	0.83500	0.00618	-0.10550	-0.00312
3.00	0.95500	0.00648	-0.10450	-0.00343
4.00	1.08500	0.00778	-0.10400	-0.00375
5.00	1.20700	0.01028	-0.10360	-0.00402
6.00	1.31700	0.01328	-0.10330	-0.00434
7.00	1.40000	0.01878	-0.10300	-0.00465
8.00	1.45000	0.02678	-0.10200	-0.00492
9.00	1.44400	0.04128	-0.11100	-0.00515
10.00	1.36500	0.06678	-0.13600	-0.00542
11.00	1.27000	0.11328	-0.15100	-0.00564
12.00	1.18000	0.15728	-0.16000	-0.00596
14.00	1.03000	0.21928	-0.17300	-0.00650
16.00	0.98000	0.25728	-0.18400	-0.00700
20.00	0.95000	0.34728	-0.20700	-0.00795
30.00	1.03000	0.66228	-0.26500	-0.01033
50.00	1.20000	1.44228	-0.36000	-0.01197
65.00	0.85000	1.81728	-0.45200	-0.01445
80.00	0.41400	2.02728	-0.52200	-0.01594
90.00	0.10000	2.06228	-0.55400	-0.01626
100.00	-0.22000	2.02728	-0.57500	-0.01581
110.00	-0.52000	1.91528	-0.58100	-0.01468
130.00	-0.95500	1.45728	-0.55600	-0.01138
162.00	-0.54000	0.29728	-0.29000	-0.00411
170.00	-0.78000	0.17228	-0.30200	-0.00203
175.00	-0.52000	0.07728	-0.26500	-0.00068
180.00	-0.10000	0.02728	0.0	0.00077
189.00	0.40000	0.08728	0.34800	0.00294
192.00	0.77000	0.15728	0.33200	0.00384
200.00	0.64000	0.29228	0.32800	0.00542
230.00	0.98000	1.39728	0.59000	0.01124
260.00	0.26000	1.97728	0.59200	0.01563
270.00	-0.05000	2.04228	0.56000	0.01630
280.00	-0.37000	2.02728	0.51200	0.01603
300.00	-0.92000	1.74228	0.40000	0.01400
330.00	-0.94000	0.72228	0.11900	0.00655
345.00	-0.87600	0.23728	-0.09000	0.00199
348.00	-0.76700	0.11628	-0.12400	0.00108
349.00	-0.68500	0.07828	-0.12200	0.00077
350.00	-0.59000	0.05428	-0.11900	0.00045
351.00	-0.48000	0.03728	-0.11800	0.00018
352.00	-0.36000	0.02528	-0.11600	-0.00014
353.00	-0.24000	0.01828	-0.11500	-0.00045
354.00	-0.12000	0.01328	-0.11400	-0.00072
355.00	0.0	0.01028	-0.11250	-0.00104
356.00	0.12000	0.00848	-0.11130	-0.00131
357.00	0.23800	0.00778	-0.11000	-0.00163
358.00	0.35500	0.00658	-0.10900	-0.00194
360.00	0.59500	0.00598	-0.10700	-0.00253

TABLE XXXIII - Continued

MACH NUMBER = 0.65 SERVO-FLAP DEFLECTION = 10., DEG

ALPHA	CL	CD	CM	CMD
0.0	0.60000	0.00830	-0.11000	-0.00370
2.00	0.75000	0.01030	-0.10500	-0.00434
3.00	0.78000	0.01380	-0.10700	-0.00465
4.00	0.80800	0.02130	-0.11900	-0.00492
5.00	0.82800	0.03180	-0.12800	-0.00519
6.00	0.84300	0.04480	-0.13700	-0.00546
7.00	0.85900	0.06280	-0.14100	-0.00569
8.00	0.87200	0.08880	-0.14600	-0.00592
9.00	0.88900	0.11580	-0.15000	-0.00614
10.00	0.90100	0.14580	-0.15400	-0.00632
11.00	0.91400	0.17280	-0.15700	-0.00655
12.00	0.92700	0.19780	-0.16100	-0.00677
14.00	0.94900	0.25180	-0.16900	-0.00709
16.00	0.96900	0.31680	-0.17900	-0.00745
20.00	1.00800	0.42180	-0.19900	-0.00808
30.00	1.08800	0.74680	-0.25600	-0.00948
50.00	1.20000	1.53680	-0.39100	-0.01233
65.00	0.85000	1.92180	-0.47700	-0.01495
80.00	0.41400	2.12680	-0.54000	-0.01671
90.00	0.10000	2.17180	-0.57000	-0.01721
100.00	-0.22000	2.12680	-0.59000	-0.01675
110.00	-0.52000	2.00680	-0.60100	-0.01558
130.00	-0.95500	1.55680	-0.57800	-0.01197
162.00	-0.54000	0.37180	-0.28000	-0.00429
170.00	-0.72000	0.18180	-0.27300	-0.00203
175.00	-0.52000	0.08680	-0.21000	-0.00045
180.00	-0.10000	0.02280	0.0	0.00109
189.00	0.40000	0.11680	0.28000	0.00316
192.00	0.77000	0.16680	0.30900	0.00384
200.00	0.64000	0.31680	0.32500	0.00564
230.00	0.98000	1.48680	0.61000	0.01152
260.00	0.26000	2.07680	0.62800	0.01188
270.00	-0.05000	2.14180	0.59200	0.01269
280.00	-0.37000	2.11680	0.55000	0.01690
300.00	-0.92000	1.83180	0.44500	0.01441
330.00	-1.02300	0.74180	0.18800	0.00754
345.00	-0.83000	0.23680	-0.10000	0.00194
348.00	-0.78900	0.15880	-0.09000	0.00077
349.00	-0.75000	0.12780	-0.11600	0.00041
350.00	-0.68000	0.09680	-0.12700	0.0
351.00	-0.58600	0.05880	-0.13000	-0.00036
352.00	-0.47000	0.01680	-0.13000	-0.00072
353.00	-0.34000	0.01230	-0.12900	-0.00113
354.00	-0.20500	0.01080	-0.12700	-0.00149
355.00	-0.07000	0.00930	-0.12400	-0.00185
356.00	0.06200	0.00580	-0.12200	-0.00221
357.00	0.20000	0.00860	-0.11900	-0.00257
358.00	0.33000	0.00820	-0.11400	-0.00278
360.00	0.60000	0.00830	-0.11000	-0.00370

TABLE XXXIII - Continued

MACH NUMBER = 0.80 SERVO-FLAP DEFLECTION = 10.0 DEG

ALPHA	CL	CD	CM	CMD
0.0	0.36500	0.04844	-0.09600	-0.00117
2.00	0.45200	0.07394	-0.10500	-0.00203
3.00	0.49000	0.09694	-0.11200	-0.00244
4.00	0.53000	0.12694	-0.11600	-0.00280
5.00	0.56800	0.15194	-0.11900	-0.00316
6.00	0.60000	0.17794	-0.12200	-0.00348
7.00	0.63000	0.19994	-0.12500	-0.00384
8.00	0.66100	0.22394	-0.12300	-0.00411
9.00	0.69200	0.24794	-0.13300	-0.00443
10.00	0.72200	0.26894	-0.14900	-0.00474
11.00	0.75000	0.28794	-0.16000	-0.00501
12.00	0.77800	0.30694	-0.17100	-0.00533
14.00	0.82800	0.36594	-0.19200	-0.00587
16.00	0.87200	0.42594	-0.21200	-0.00641
20.00	0.95000	0.54594	-0.24700	-0.00741
30.00	1.07000	0.91594	-0.28700	-0.00975
50.00	1.20000	1.61594	-0.42200	-0.01332
65.00	0.85000	1.99594	-0.50900	-0.01603
80.00	0.41400	2.22994	-0.57200	-0.01784
90.00	0.10000	2.29594	-0.60900	-0.01811
100.00	-0.22000	2.27094	-0.62300	-0.01761
110.00	-0.52000	2.15594	-0.63300	-0.01648
130.00	-0.95500	1.63594	-0.50900	-0.01264
162.00	-0.54000	0.40594	-0.28000	-0.00438
170.00	-0.78000	0.19594	-0.17200	-0.00203
175.00	-0.52000	0.09794	-0.08900	-0.00027
190.00	-0.10000	0.04594	0.0	0.00131
189.00	0.40000	0.17594	0.16200	0.00366
192.00	0.77000	0.22094	0.21200	0.00452
200.00	0.64000	0.39594	0.34000	0.00655
230.00	0.59000	1.58094	0.63000	0.01319
260.00	0.26000	2.21594	0.65100	0.01761
270.00	-0.05000	2.26094	0.61300	0.01806
280.00	-0.37000	2.21094	0.58000	0.01770
300.00	-0.92000	1.85594	0.47800	0.01517
330.00	-0.98000	0.76594	0.25800	0.00948
345.00	-0.60500	0.21594	0.06200	0.00551
348.00	-0.50200	0.16594	0.01600	0.00452
349.00	-0.46200	0.15244	-0.00200	0.00415
350.00	-0.42600	0.13644	-0.01600	0.00379
351.00	-0.38500	0.12394	-0.02800	0.00343
352.00	-0.34000	0.10694	-0.03900	0.00298
353.00	-0.28800	0.09294	-0.05100	0.00257
354.00	-0.23000	0.07894	-0.06200	0.00203
355.00	-0.14500	0.06694	-0.07300	0.00154
356.00	0.04500	0.05694	-0.08100	0.00070
357.00	0.14000	0.04994	-0.09600	0.00032
359.00	0.26000	0.04544	-0.08700	-0.00023
360.00	0.36500	0.04844	-0.09600	-0.00117

APPENDIX V
CONTROL SYSTEM KINEMATICS

As mentioned previously, the heart of the CTR system consists of a torsionally elastic blade with dual controls. A schematic illustrating the controls for this rotor system is shown in Figure 41. As seen in this schematic, little complexity is added to the rotating control system used typically in contemporary helicopters. Conventional pitch links control the blade angle at the inboard end of the rotor. The flap controls the outboard blade angle. The flap also controls the degree of twist along the rotor blade, thus increasing the uniformity of the airload over the rotor disk.

The control mechanisms for the dual system are based on existing technology. Control rods for the flap system are connected to a swashplate under the hollow rotor drive shaft, and runs up through the hollow drive to a walking beam on top of the rotor hub. Control action continues across the walking beam, down to an L-crank, across another walking beam, and out through the blade on a control rod connected to the flap near the tip of the blade. The pitch horns attached to the blade root are connected by control rods to a separate swashplate on the outside of the drive shaft. The two swashplates are actuated by linkages from the mixing box which is inserted between the pilot's collective and cyclic pitch controls and the swashplates. The mixing box is responsive to forward speeds and automatically determines optimum blade angles needed to carry out the pilot's directions. If a pilot wants to go faster, he generally will move his cyclic pitch stick forward, and the mixing box will translate cyclic stick motion into the proper control phasing to produce the most efficient blade twist for increasing aircraft speed.

The following list contains the components of the control system and also describes the functions of these components.

ITEM	FUNCTION
Flap swashplate	Actuates servo flap
Blade swashplate	Actuates blade root pitch
Collective control	Actuates both swashplates for collective control
Cyclic control	Actuates both swashplates for cyclic control

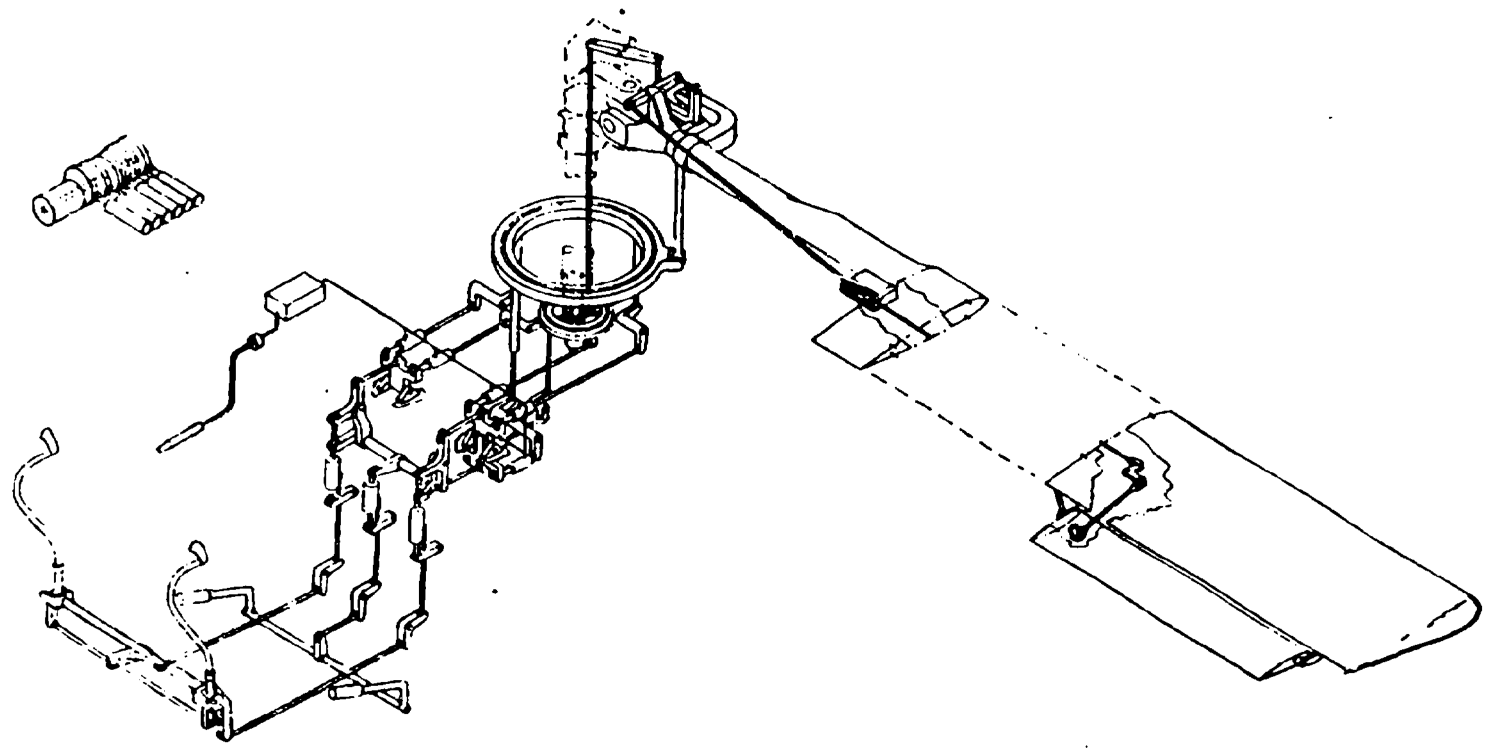

Figure 41. Schematic of the Complete Servo-Flap Actuator System.

ITEM	FUNCTION
Primary hydraulic boost	Provides hydraulic boost power to blade swashplate
Secondary hydraulic boost	Provides ASE control input to both servo flap and blade pitch
CTR input actuators	Provides differential control to both swashplates as programmed by the CTR differentiator
CTR differentiator	Converts airspeed signal into proper CTR requirement
Servo angular positioner	Positions the (6) CTR input cams angularly according to airspeed
CTR input cams	Profiled according to optimum CTR control requirements. Six cams are installed, three for each swashplate, controlling the longitudinal, lateral, and collective positioning of each swashplate
Linear potentiometers	Transfers cam motion into electrical signal to CTR input actuators
Airspeed pickup	Conventional pitot tube
Pressure transducer	Converts airspeed into an electrical signal

In order to properly design the CTR input actuators and differentiators, it is required to know how the flap and pitch horn controls relate to each other. In running the computer cases for the CTR G configuration, it was found that a linear relationship existed between the two control systems. This relationship is expressed by the following equation:

$$
\begin{vmatrix} A_o \\ B_{1s} \\ A_{1s} \end{vmatrix} = \begin{vmatrix} b_o & b_1 & b_2 & b_3 \\ c_o & c_1 & c_2 & c_3 \\ d_o & d_1 & d_2 & d_3 \end{vmatrix} \begin{vmatrix} 1 \\ \delta_o \\ \delta_{1s} \\ \delta_{1c} \end{vmatrix} \qquad (51)
$$

The linear coefficients in Equation (51) are shown as a function of speed in Figure 42. Figure 42 shows the intercepts for the pitch horn requirements for zero servo flap inputs and the changes in pitch horn collective due to changes in servo flap collective and cyclic controls. Also shown are the effect of changes in servo longitudinal and lateral controls. These figures indicate a linear relationship with speed of b_1, b_2, b_3, c_2, c_3, d_1, d_2, and d_3. The linear relationship or constant relationships with speed are significant because they greatly simplify the design of the actuating systems.

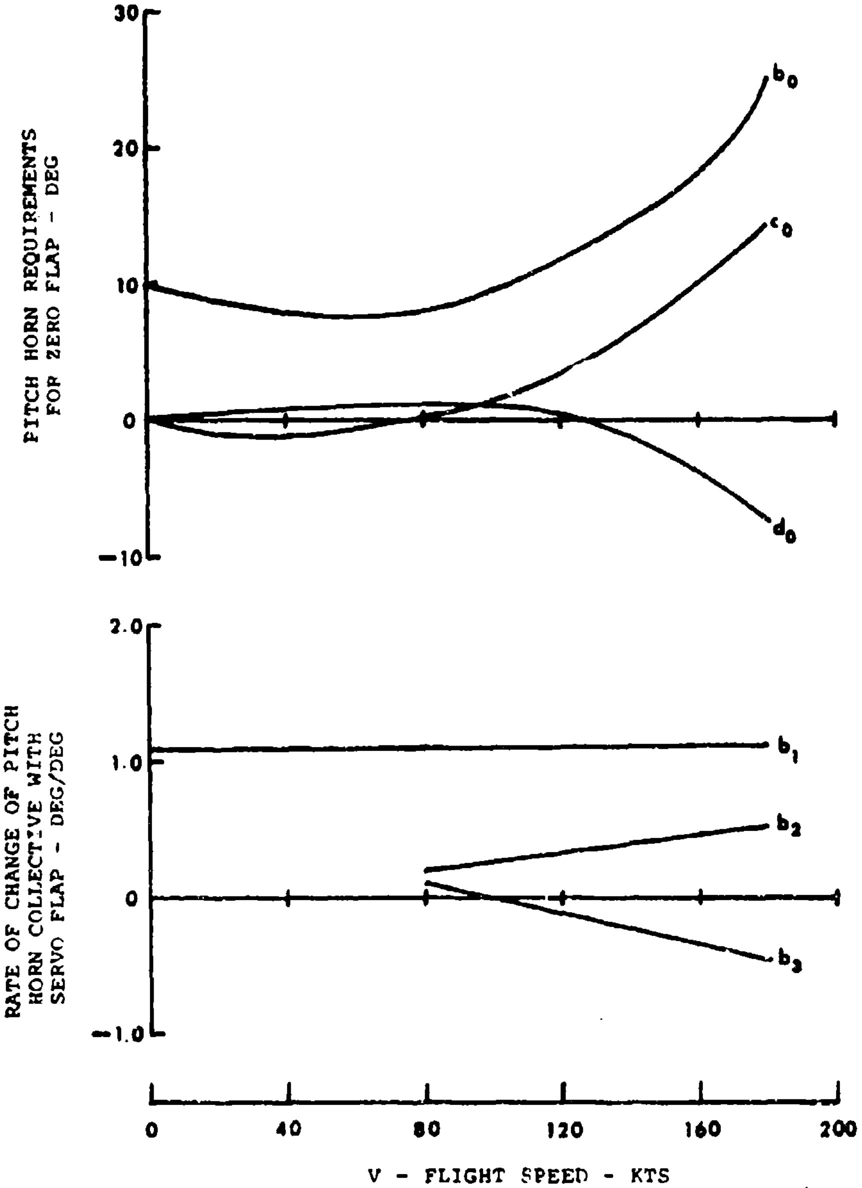

Figure 42. Coefficients for the Relationship Between the Servo-Flap and Pitch Horn Controls for Trimmed Conditions.

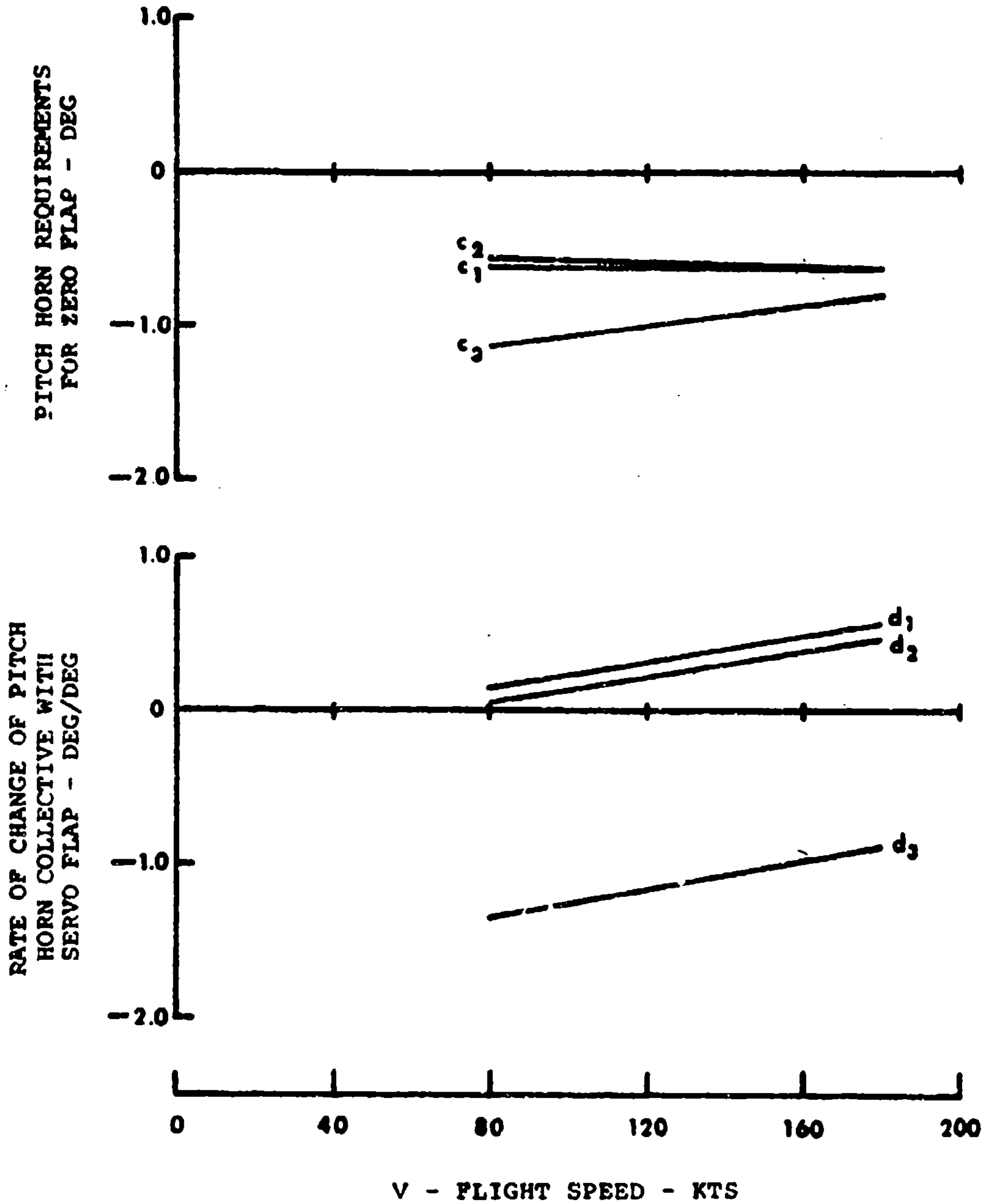

Figure 42 - Concluded

APPENDIX VI
TRIMMED FLIGHT CHARACTERISTICS

The effects of main rotor power, maximum blade section angle of attack, elastic flapwise tip bending deflection, and load factor have been previously discussed, using Figures 12 through 15. The cases chosen for these figures were obtained from the runs at the various speeds described in Appendix III. Only the minimum power cases were chosen at speeds below stall. At the high-speed condition, the optimum cases were chosen from unstalled cases only (not minimum power). The optimum cases have already been described in Table II for the CTR along with equivalent cases run on the DCR. Due to a large quantity of output contained with each fully trimmed computer run, it is considered impractical to present all of the data for these cases in this report. However, selected items were chosen from the output of each trimmed case in Table II and are plotted in Figures 43 through 146 as shown in this Appendix. For each case considered, the following curves are presented:

1. Angle-of-attack contour plots.
2. Time histories of the input control and response modes.
3. Harmonic analysis of the response modes.
4. Time histories of the blade section angles of attack.
5. Time histories of the out-of-plane airloads.
6. Harmonic analysis of the out-of-plane airloads.
7. Time histories of the in-plane airloads.
8. Harmonic analysis of the in-plane airloads.

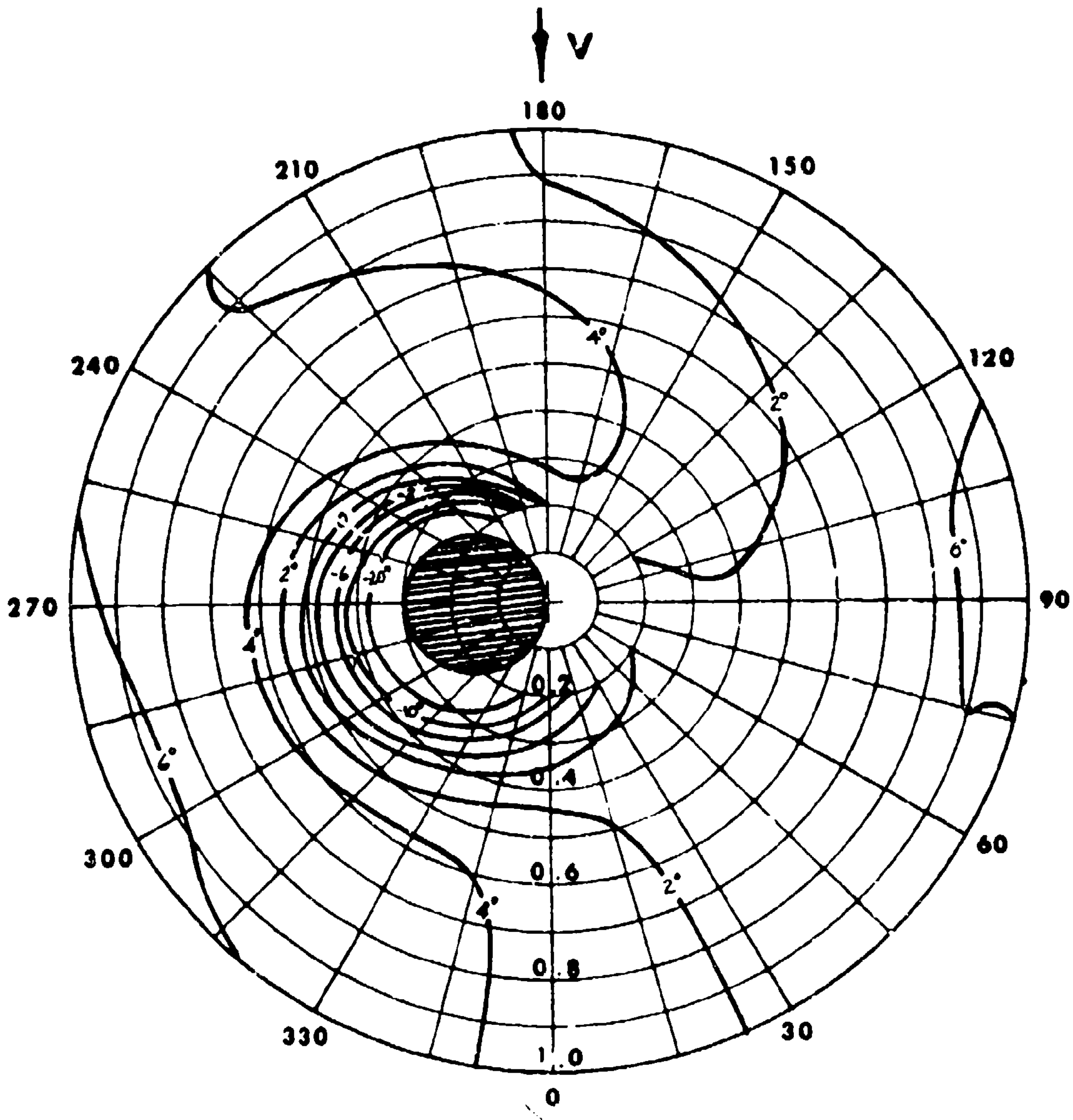

Figure 43. Angle-of-Attack Contours for the 4-Bladed CTR-G Configuration, V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

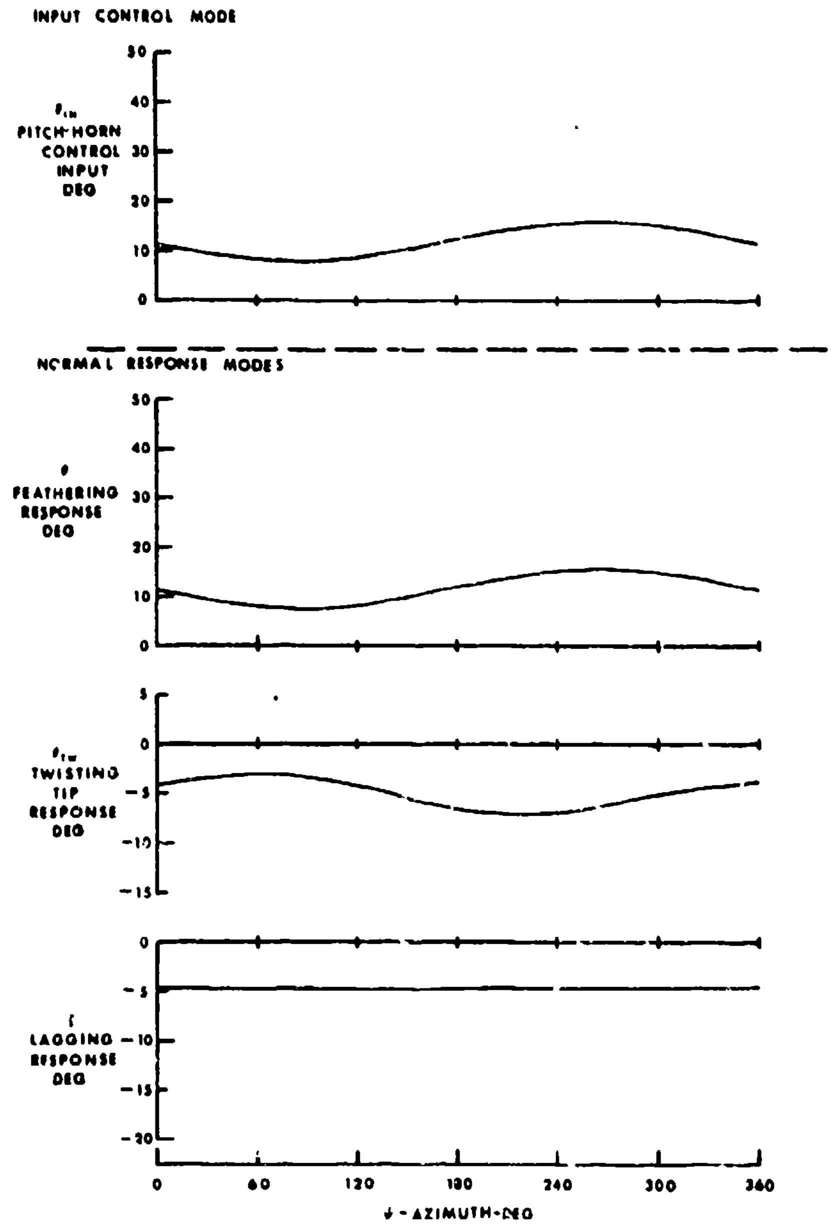

Figure 44. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

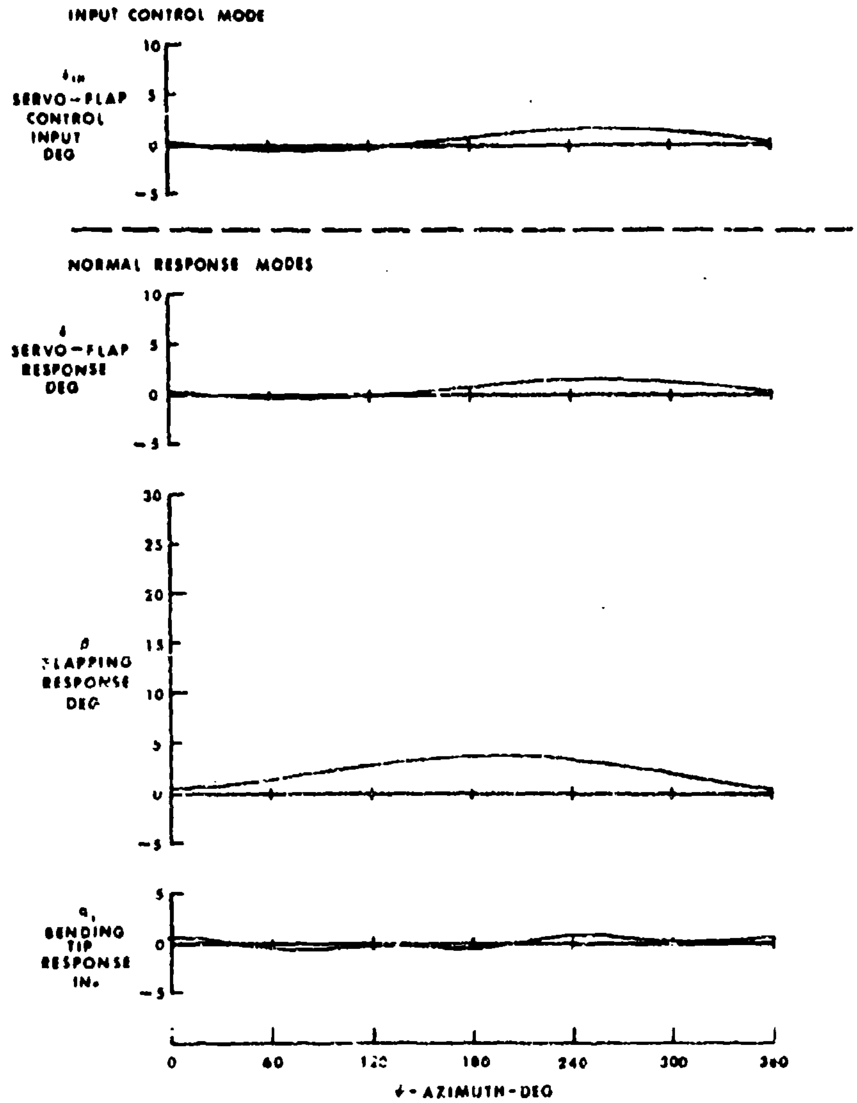

Figure 44 - Concluded

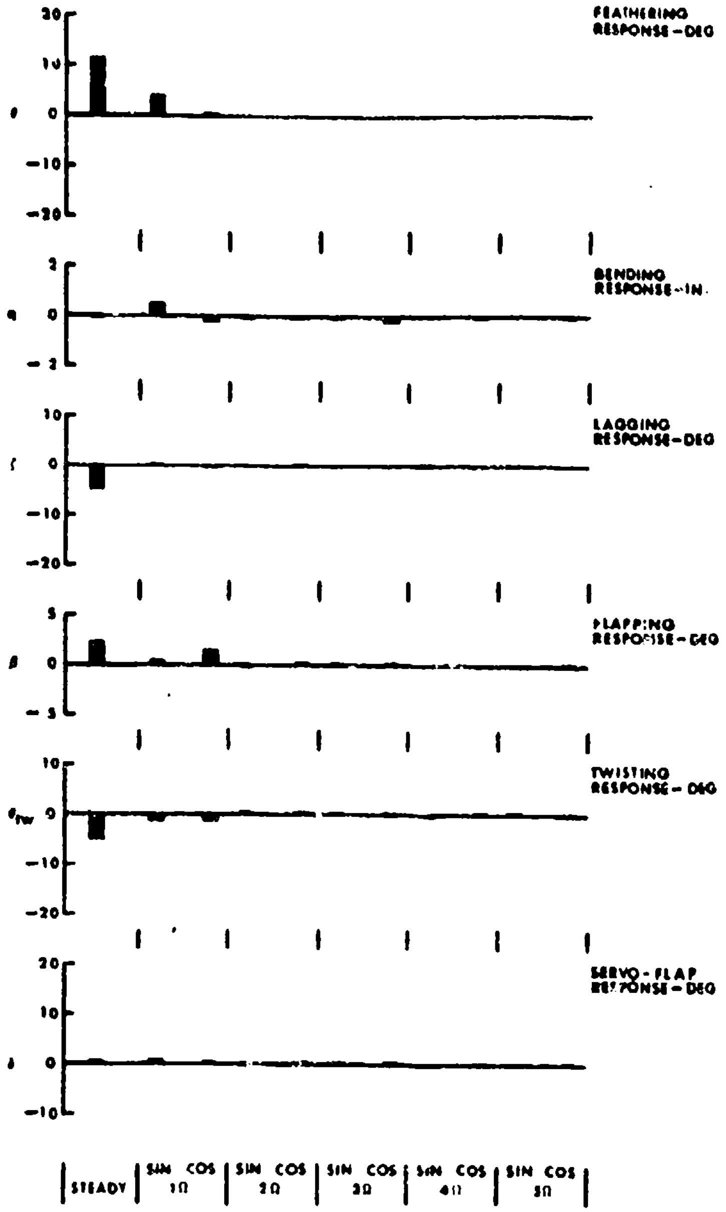

Figure 45. Normal Response Mode Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 120 Knots; η_z = 1.0; Case No. 765-AQ.

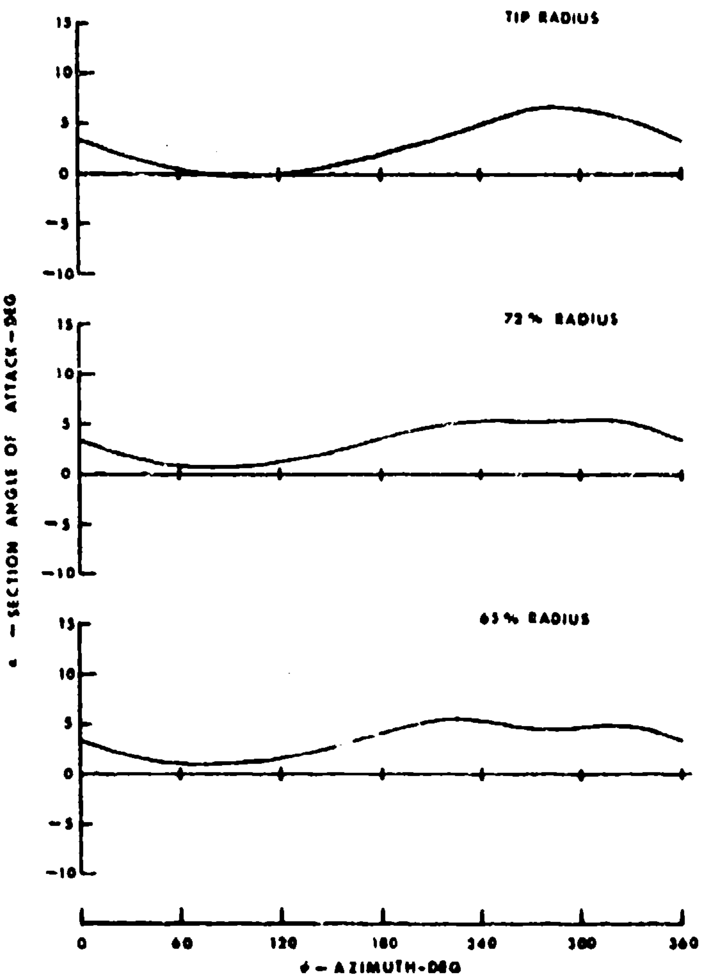

Figure 46. Angle-of-Attack Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

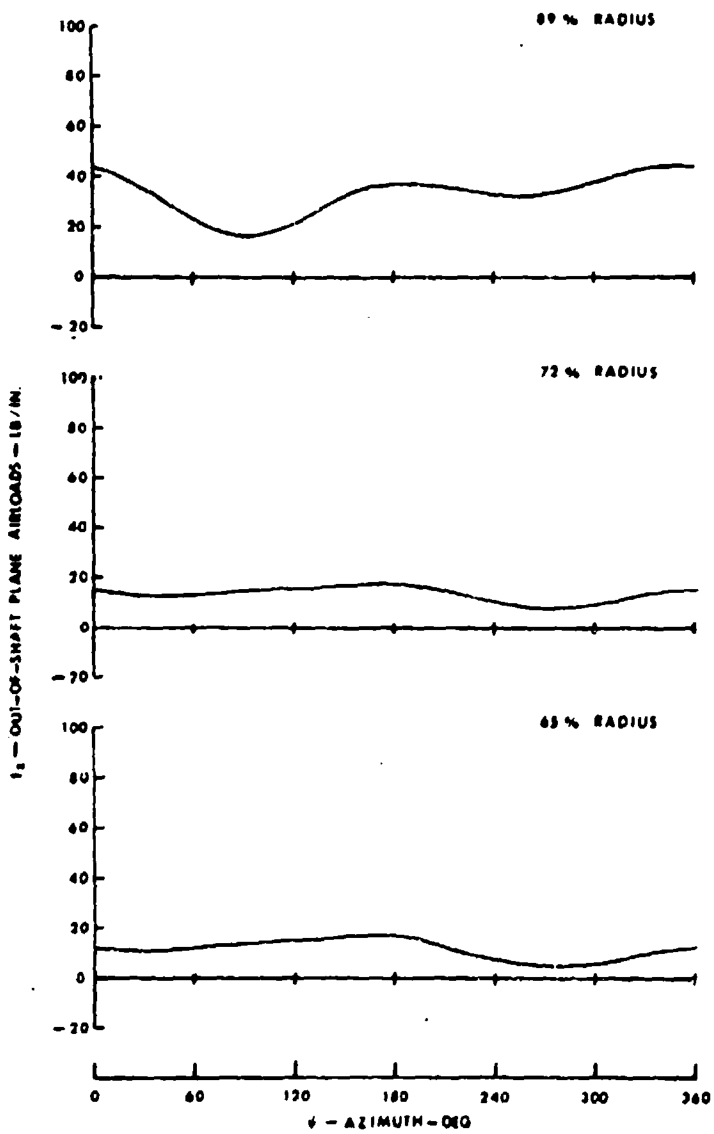

Figure 47. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

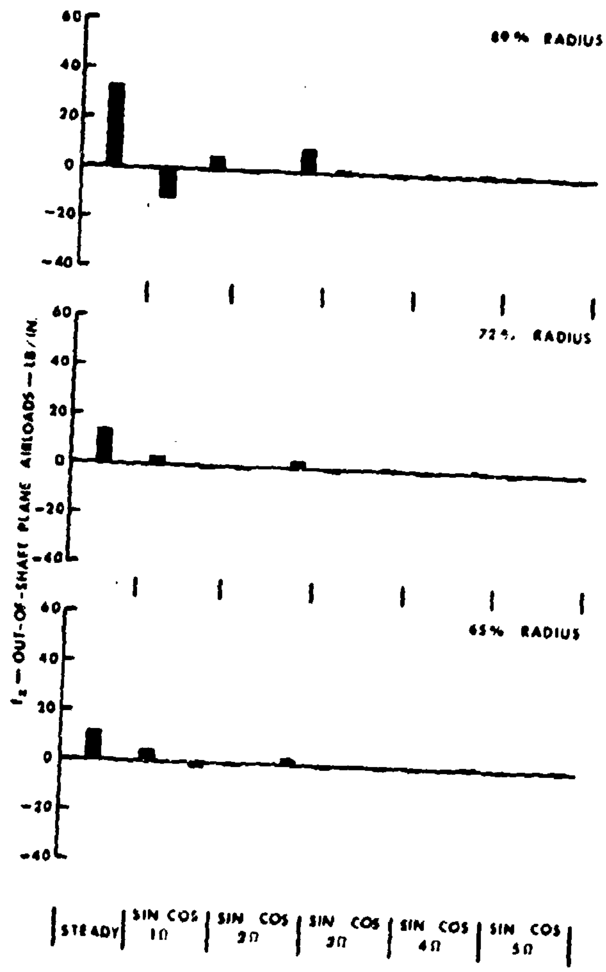

Figure 48. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

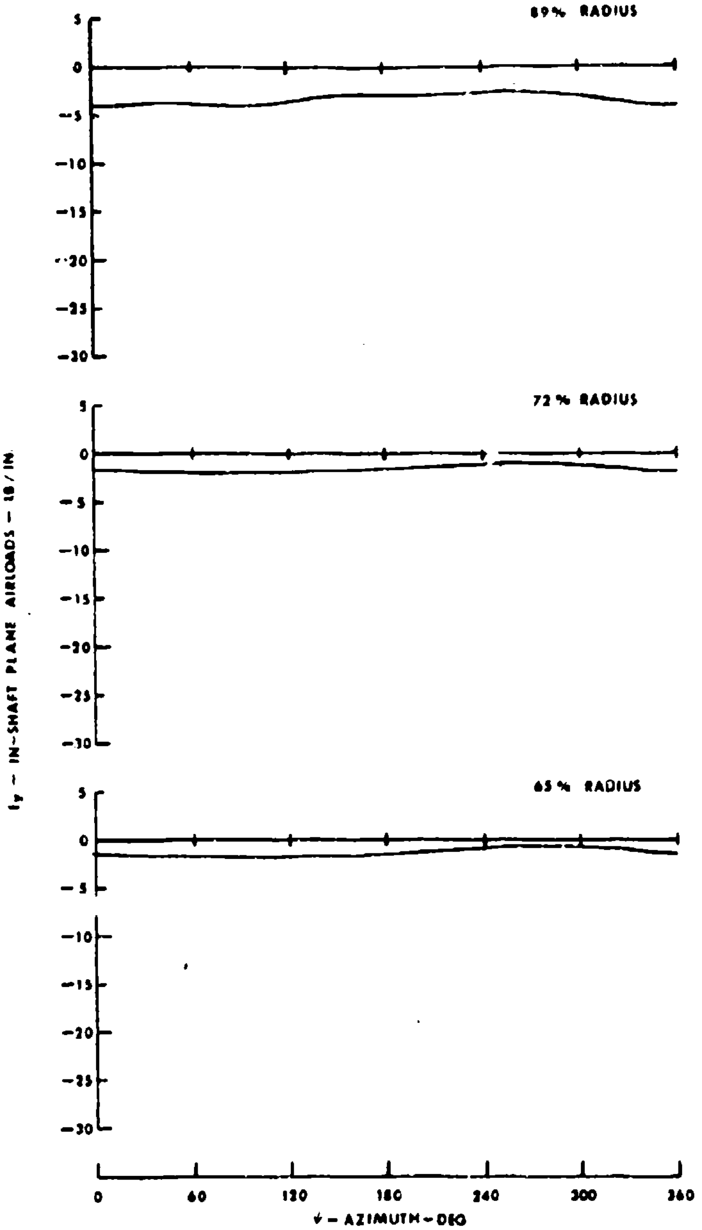

Figure 49. In-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

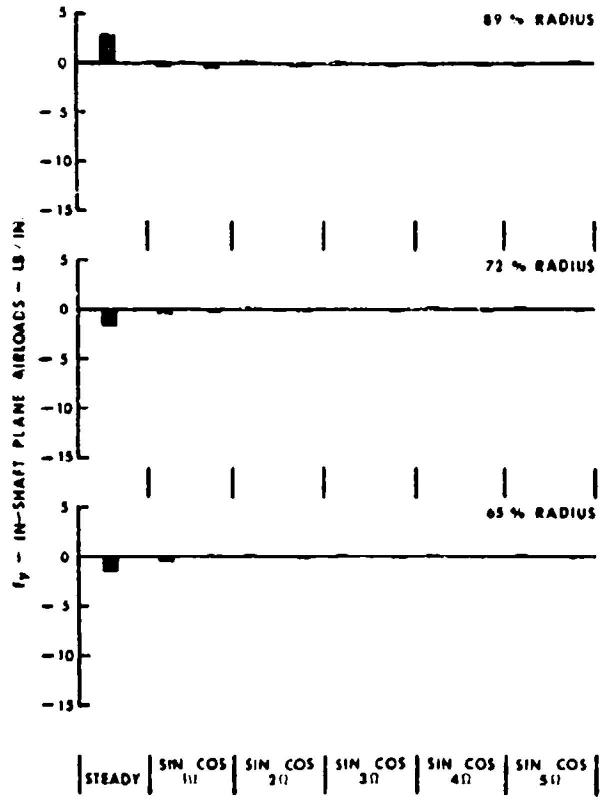

Figure 50. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.0; Case No. 765-AQ.

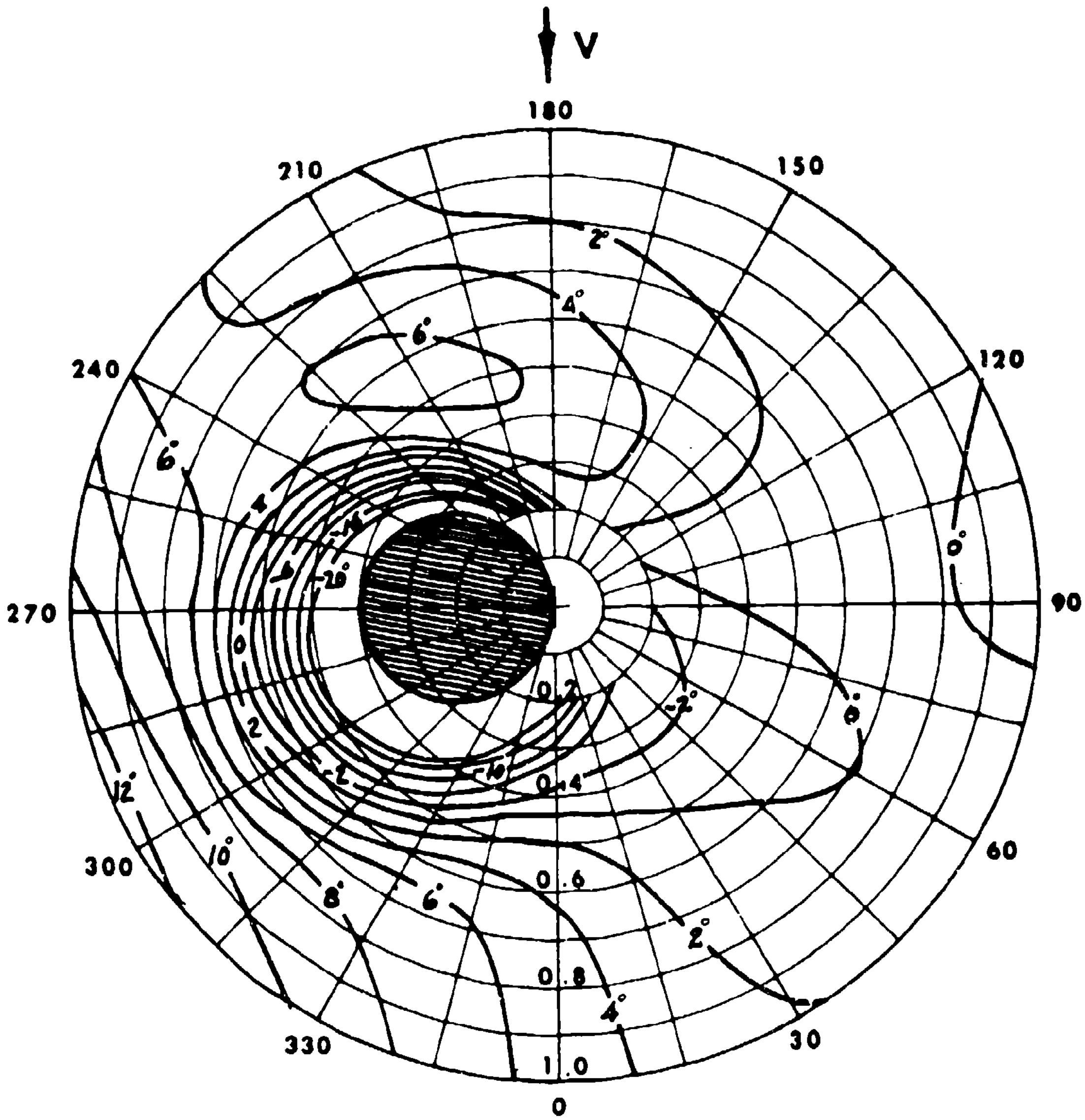

Figure 51. Angle-of-Attack Contours for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.0; Case No. 756-AL.

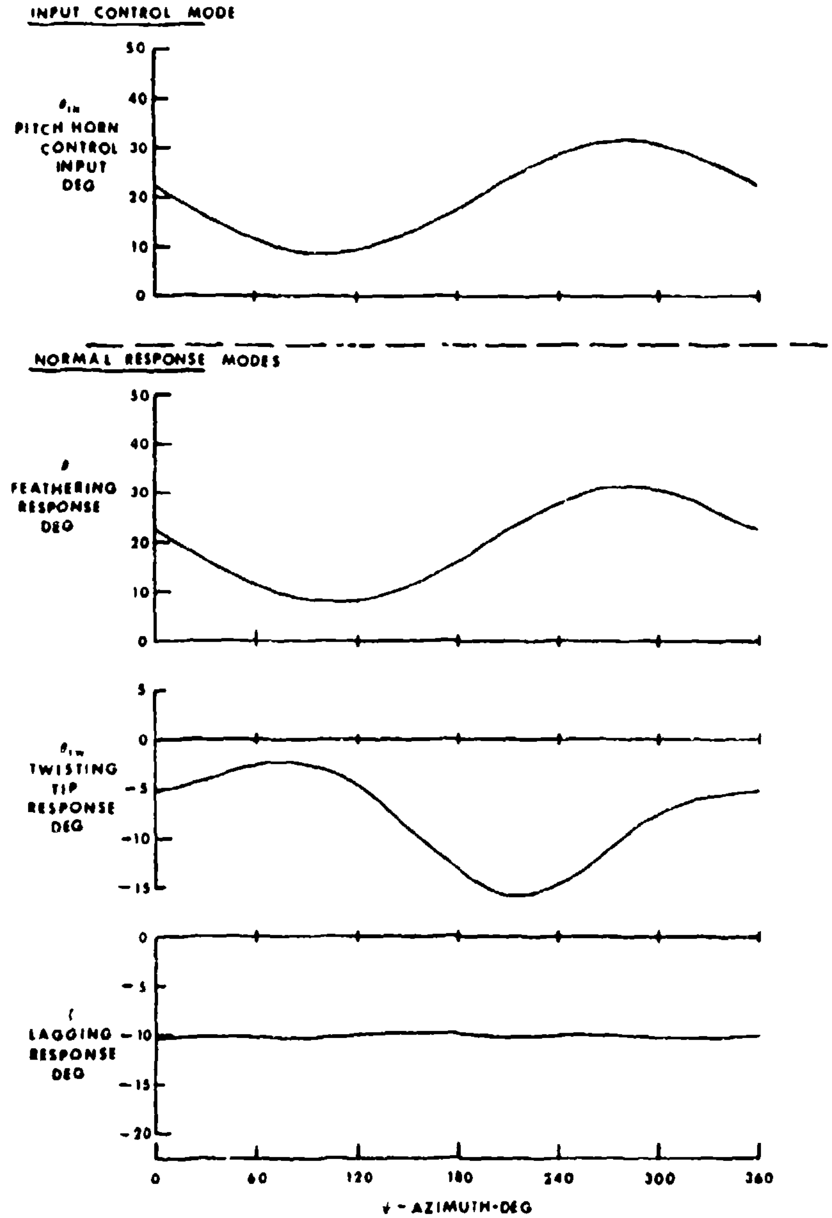

Figure 52. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.0; Case No. 756-AL.

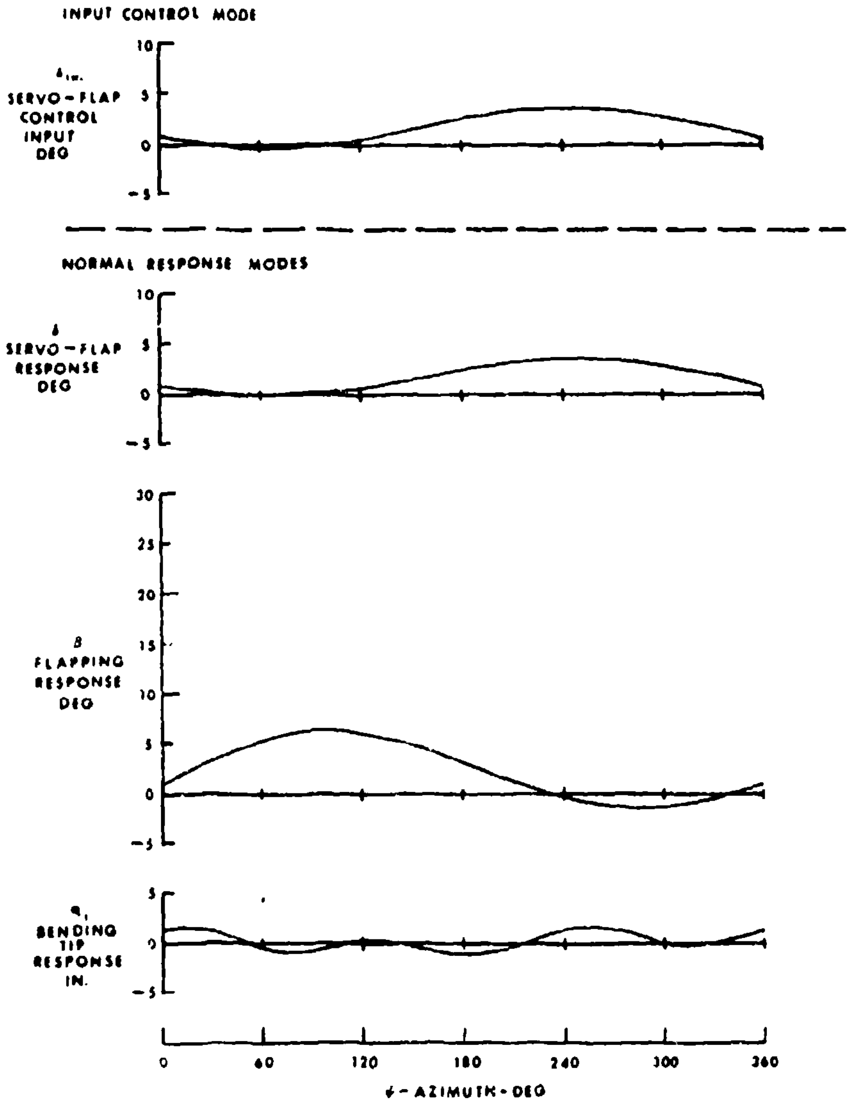

Figure 52 - Concluded

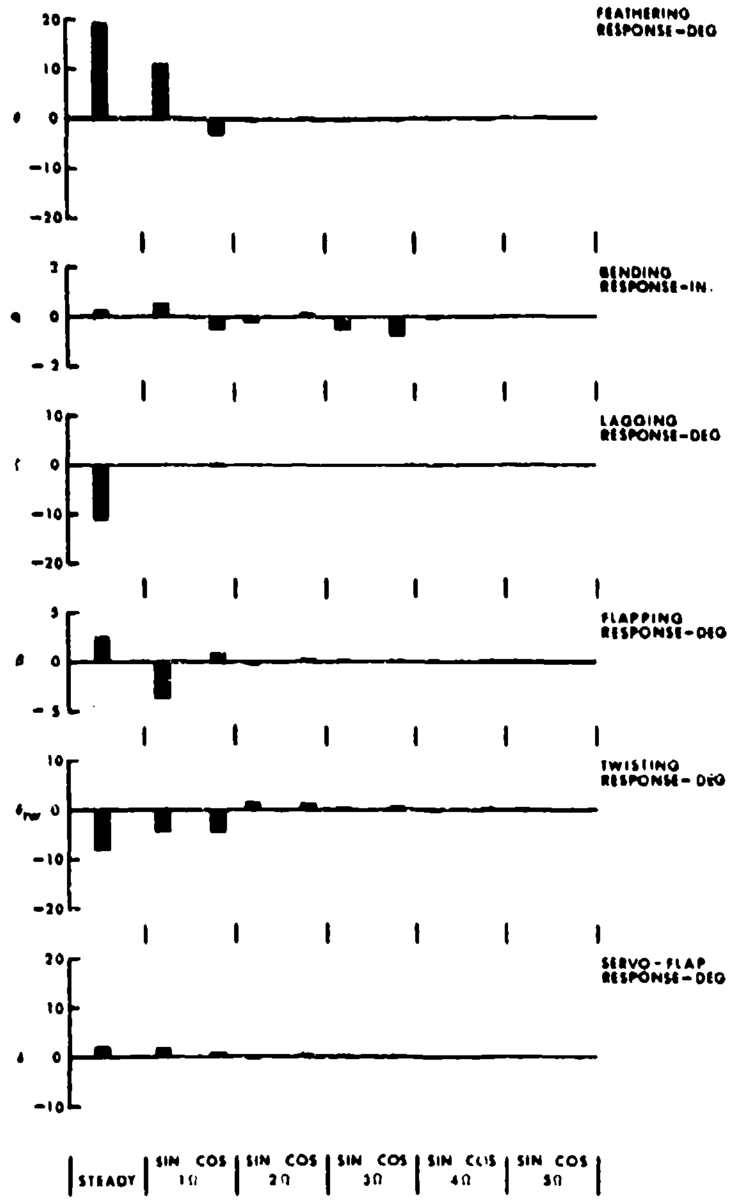

Figure 53. Normal Response Mode Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.0; Case No. 756-AL.

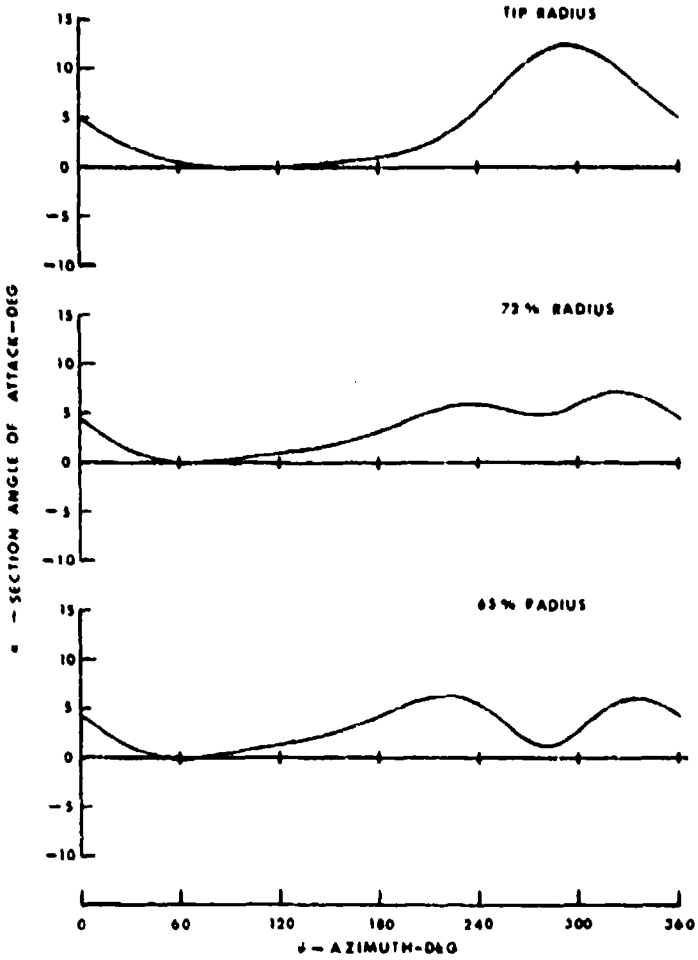

Figure 54. Angle-of-Attack Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.0; Case No. 756-AL.

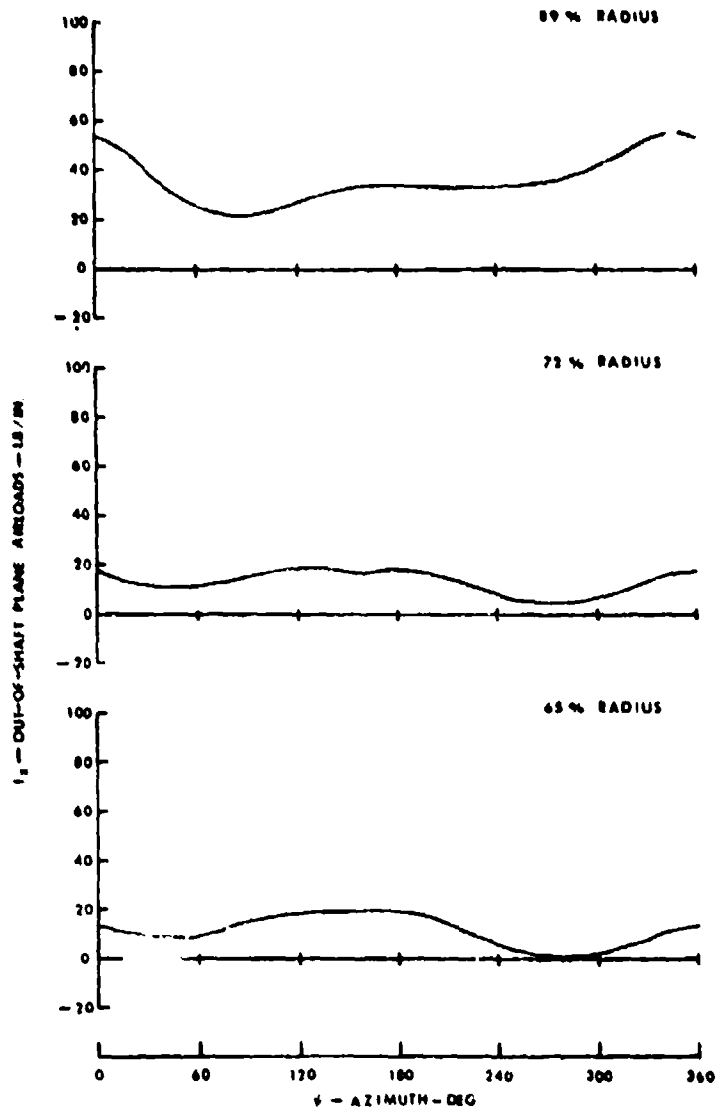

Figure 55. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.0; Case No. 756-AL.

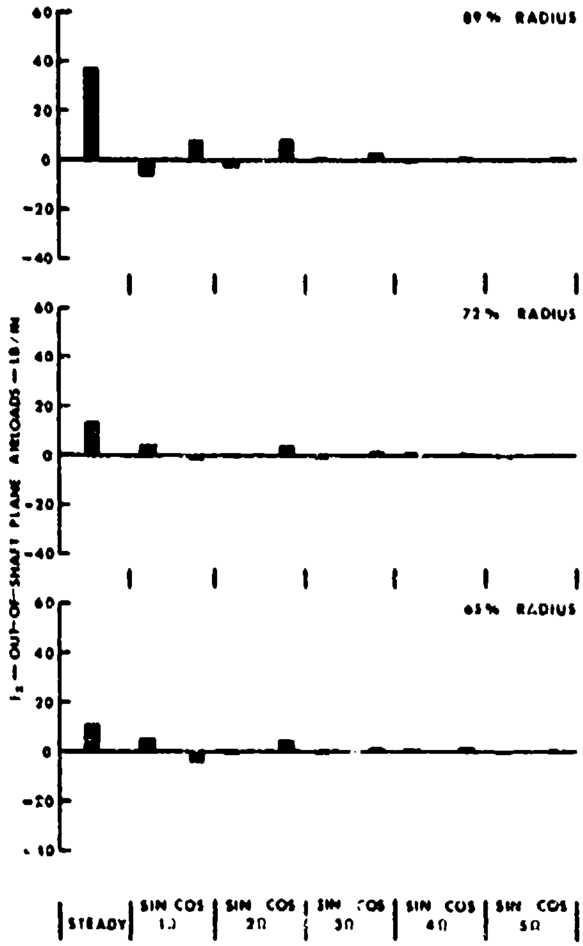

Figure 56. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 160 Knots; η_z = 1.0; Case No. 756-AL.

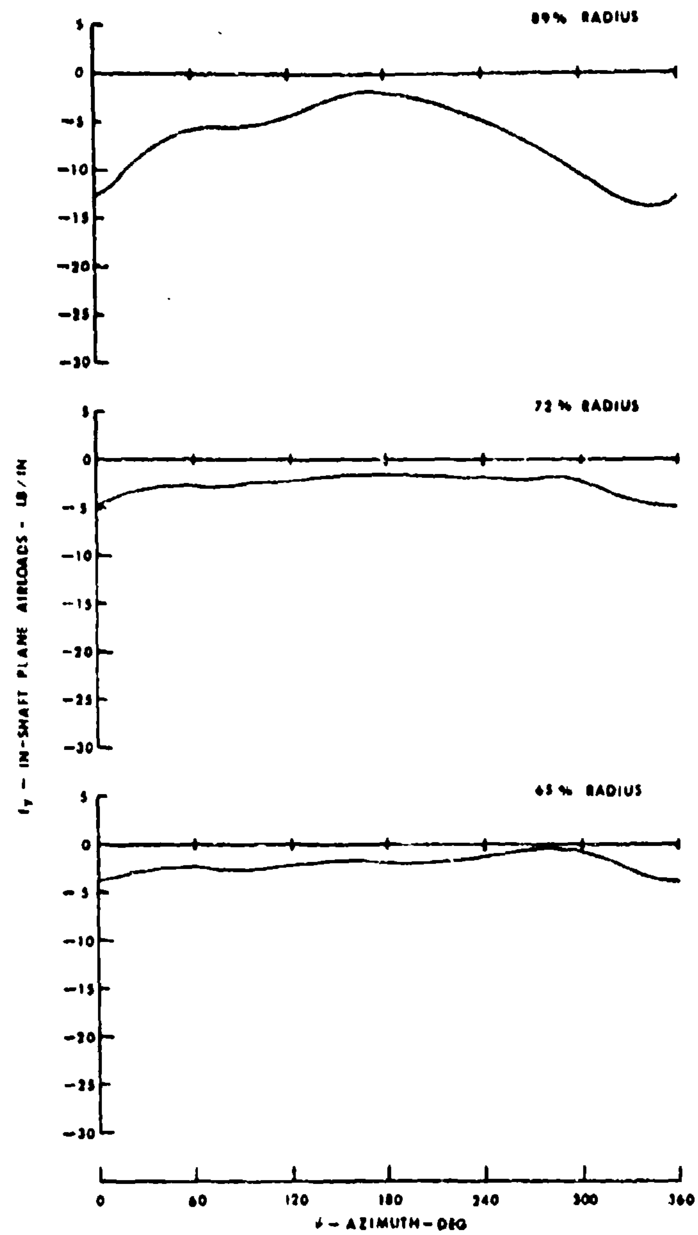

Figure 57. In-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; η_z = 1.0; Case No. 756-AL.

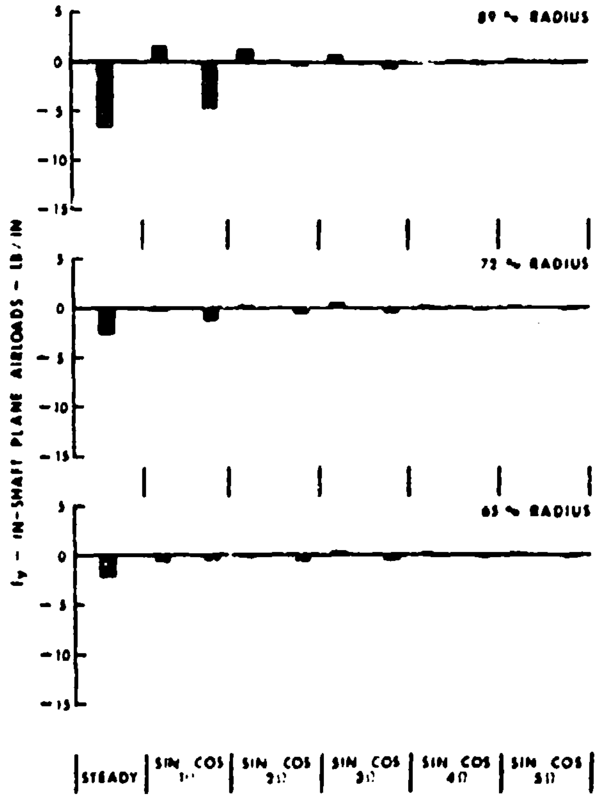

Figure 58. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.0; Case No. 756-AL.

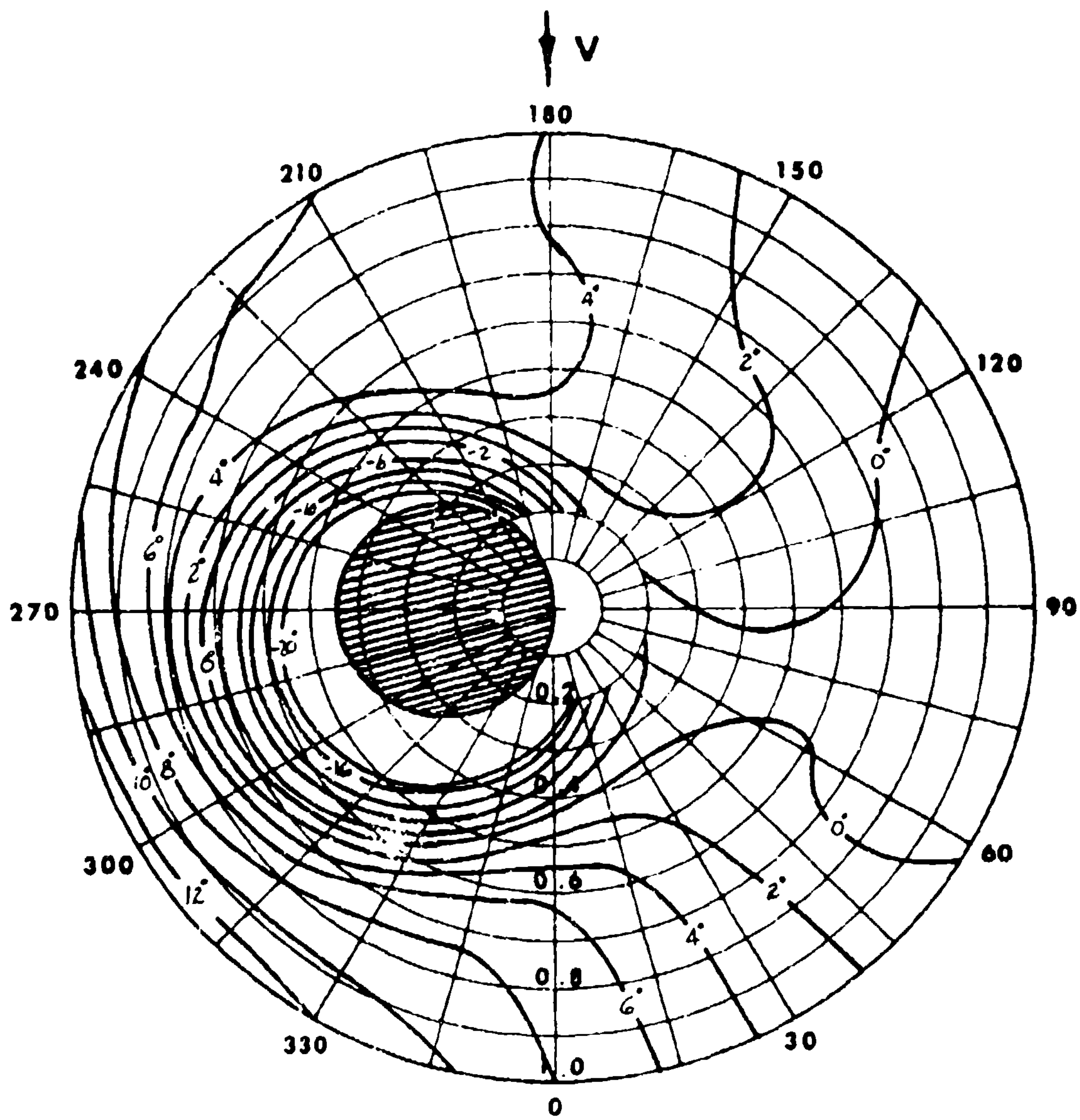

Figure 59. Angle-of-Attack Contours for the 4-Bladed CTR-G Configuration, V = 180 Knots; $\bar{\ }_z$ = 1.0; Case No. 770-F3.

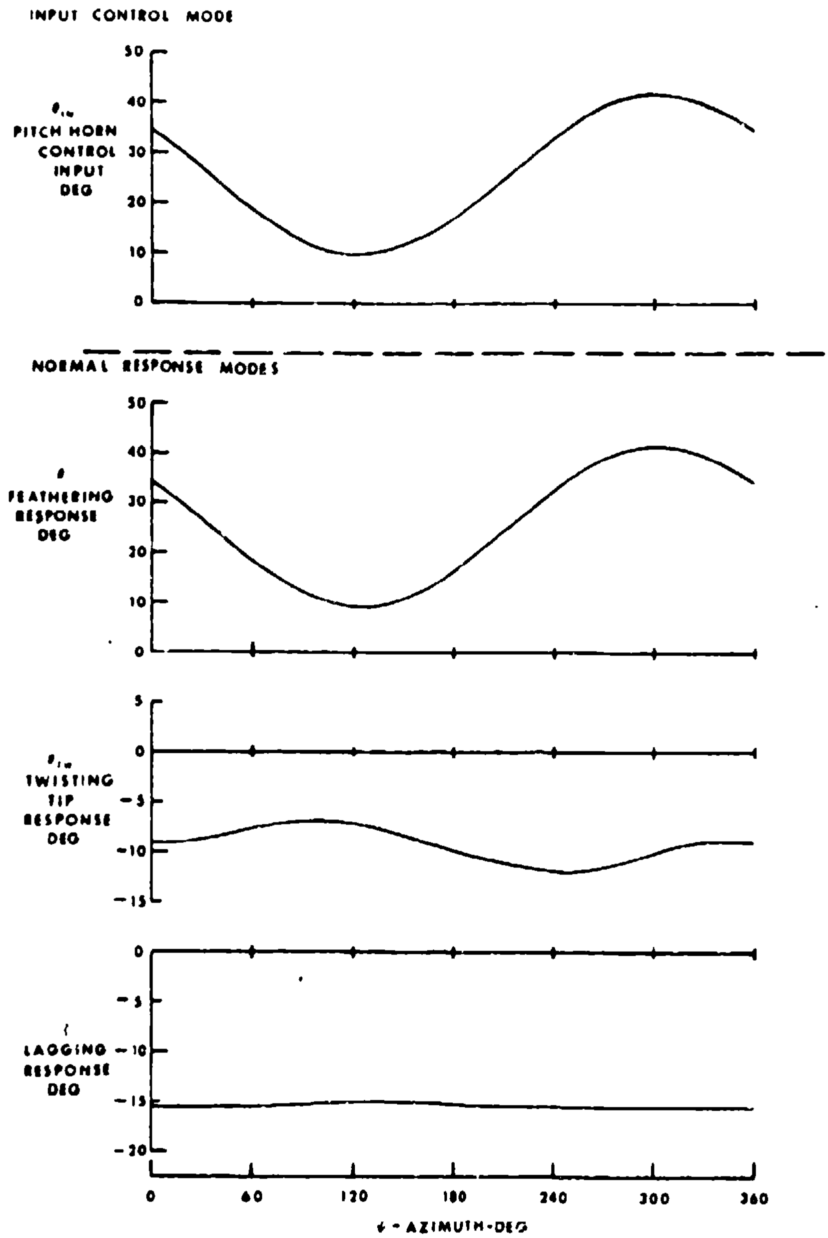

Figure 60. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed CTR-G Configuration; V = 180 Knots; η_z = 1.0; Case No. 770-F3.

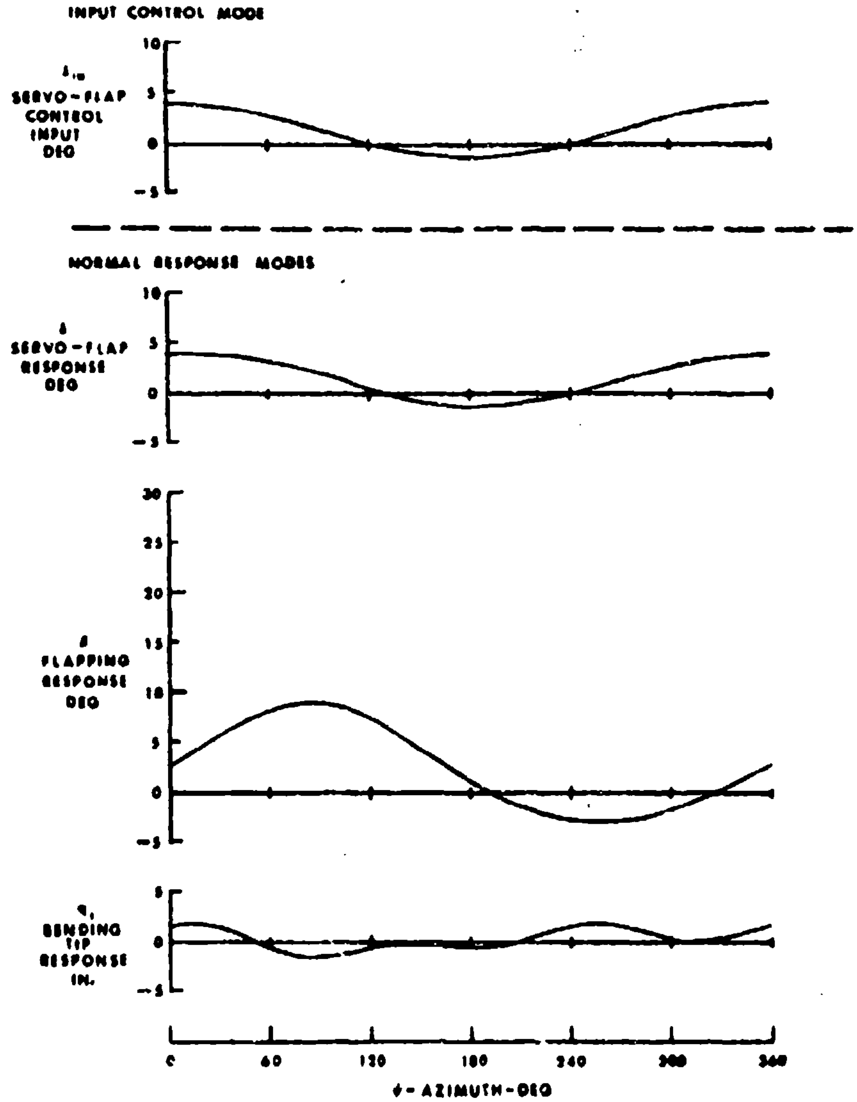

Figure 60 - Concluded

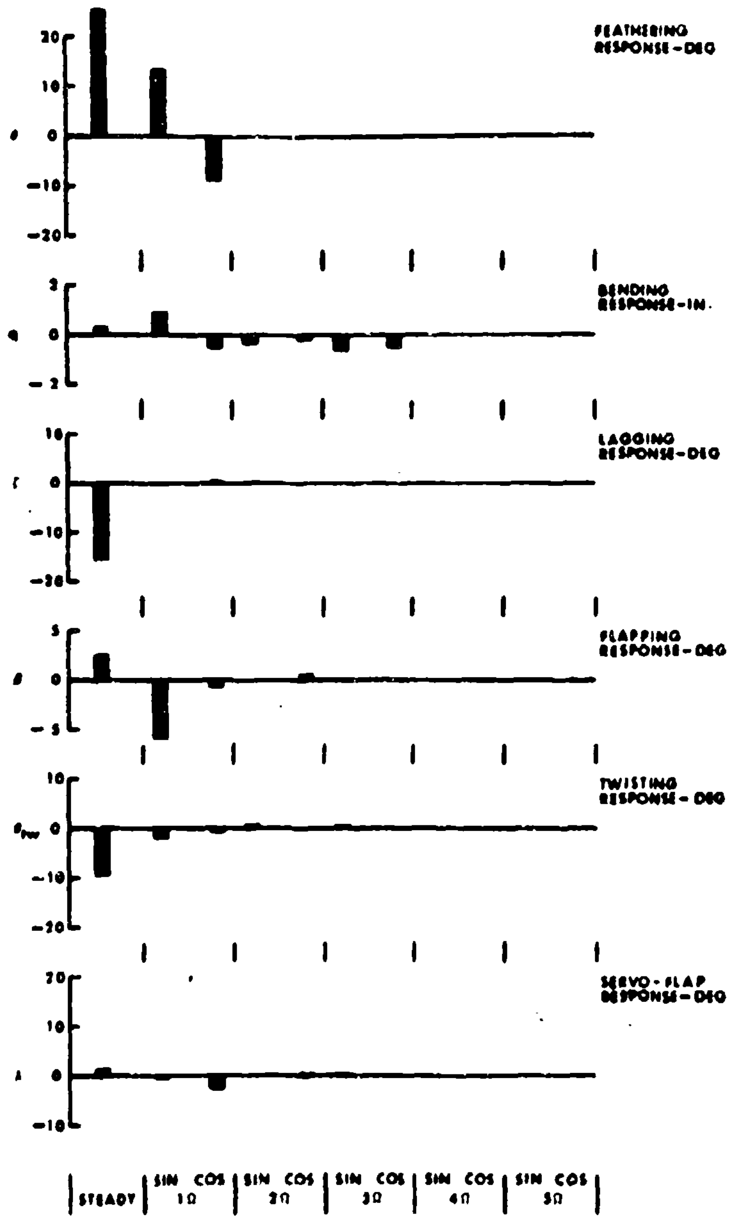

Figure 61. Normal Response Mode Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 180 Knots; η_z = 1.0; Case No. 770-F3.

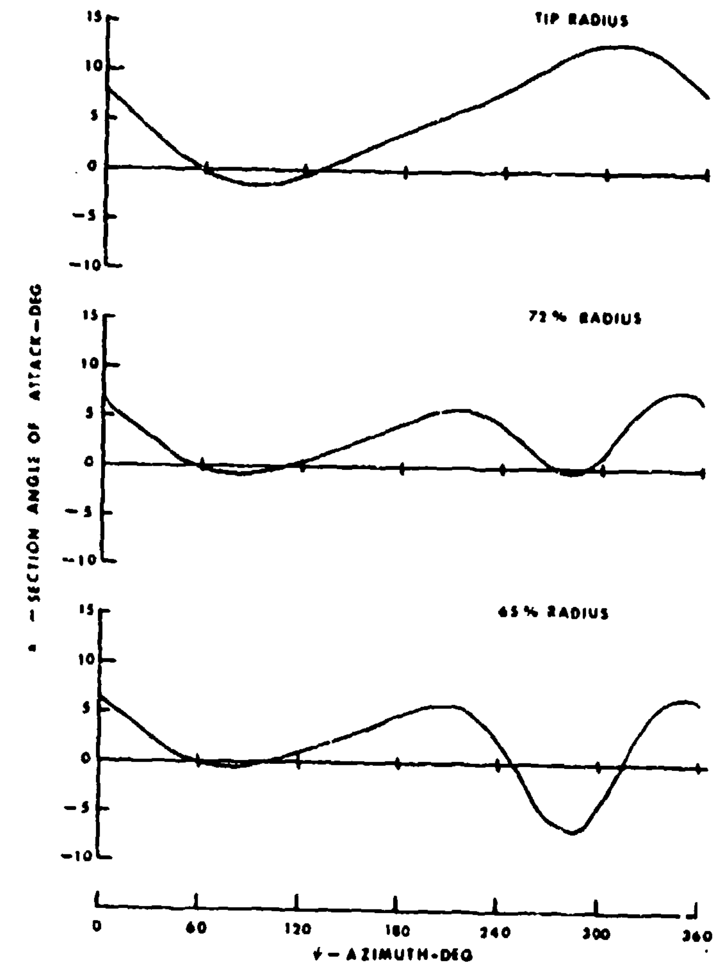

Figure 62. Angle-of-Attack Time Histories for the 4-Bladed CTR-G Configuration; V = 180 Knots; n_z = 1.0; Case No. 770-F3.

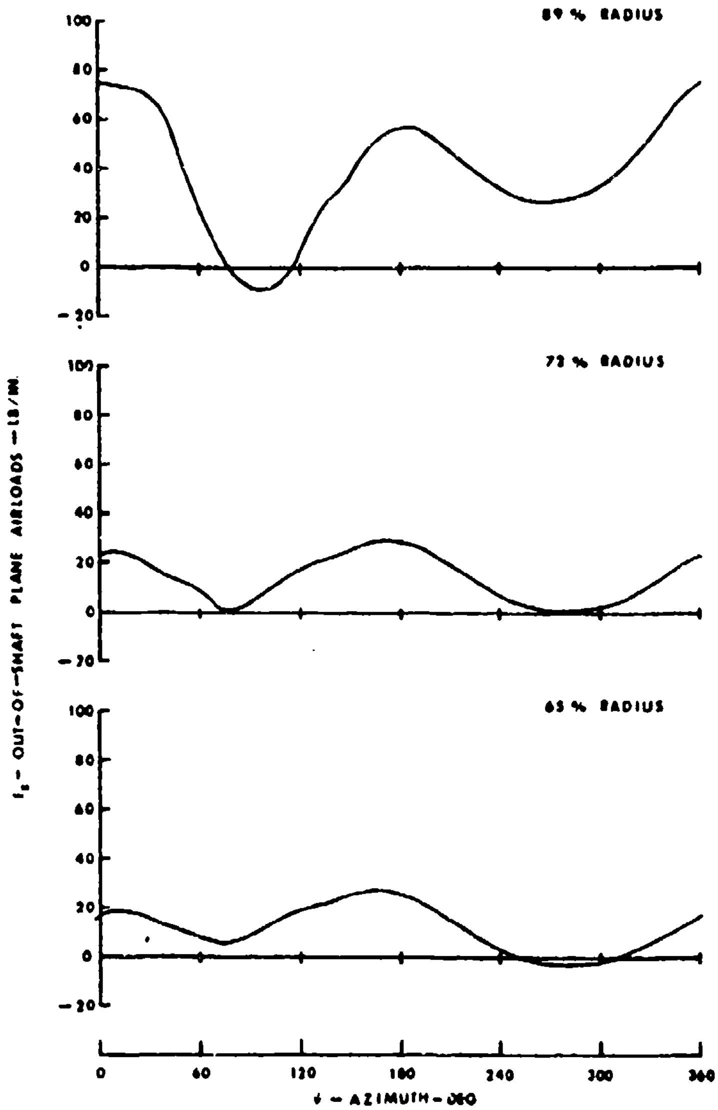

Figure 63. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 180 Knots; η_z = 1.0; Case No. 770-F3.

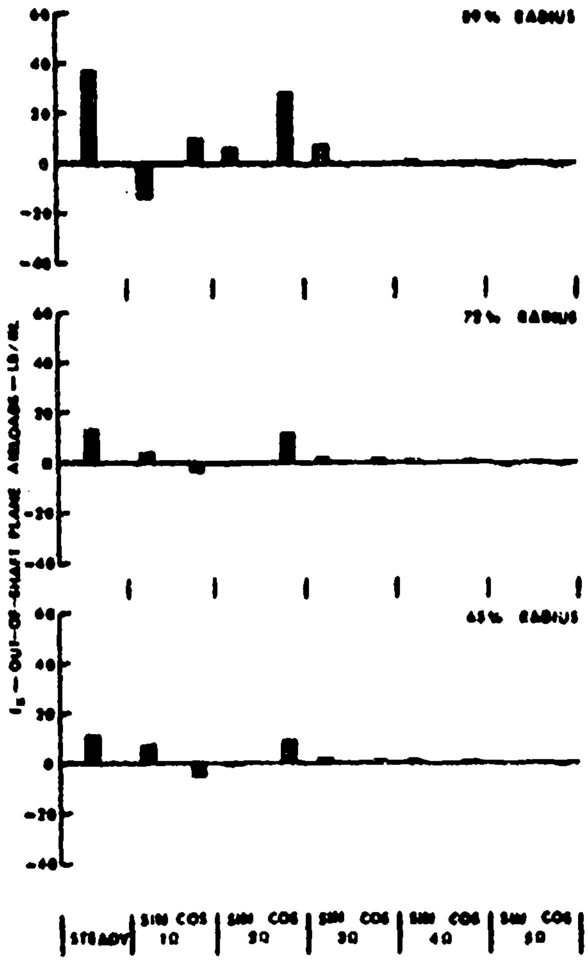

Figure 64. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 180 Knots; n_z = 1.0; Case No. 770-F3.

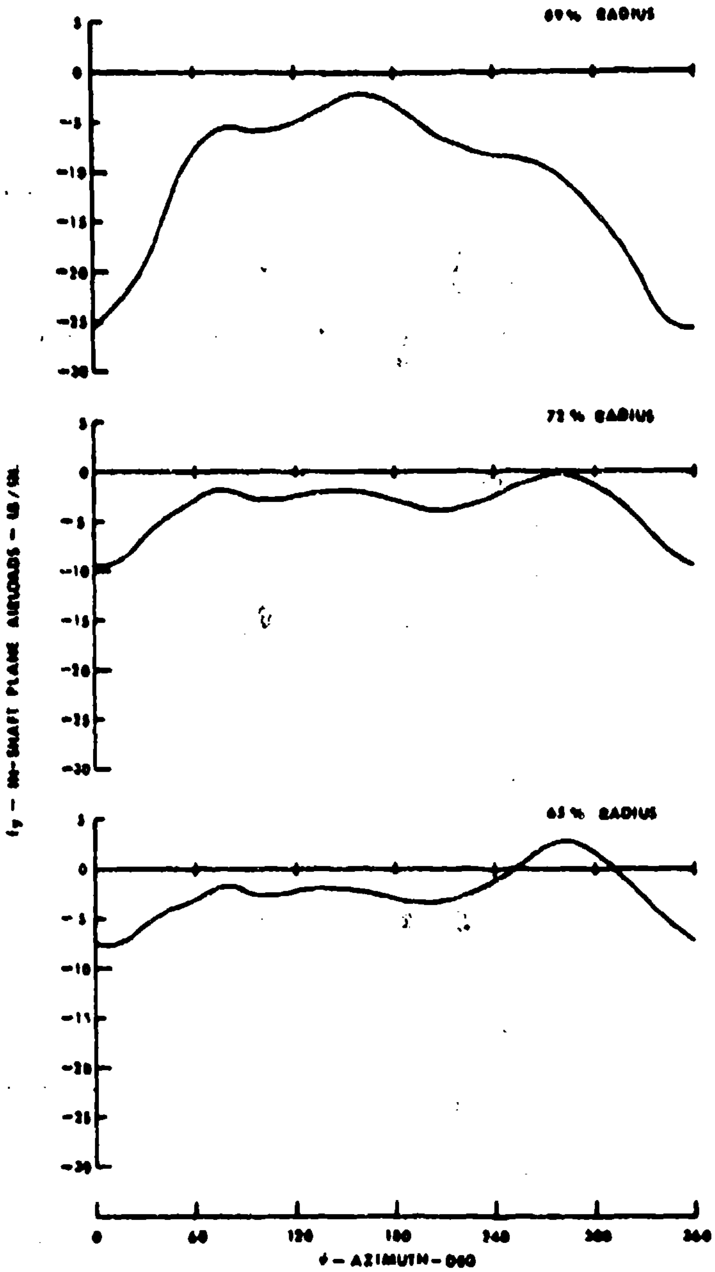

Figure 65. In-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 180 Knots; η_z = 1.0; Case No. 770-F3.

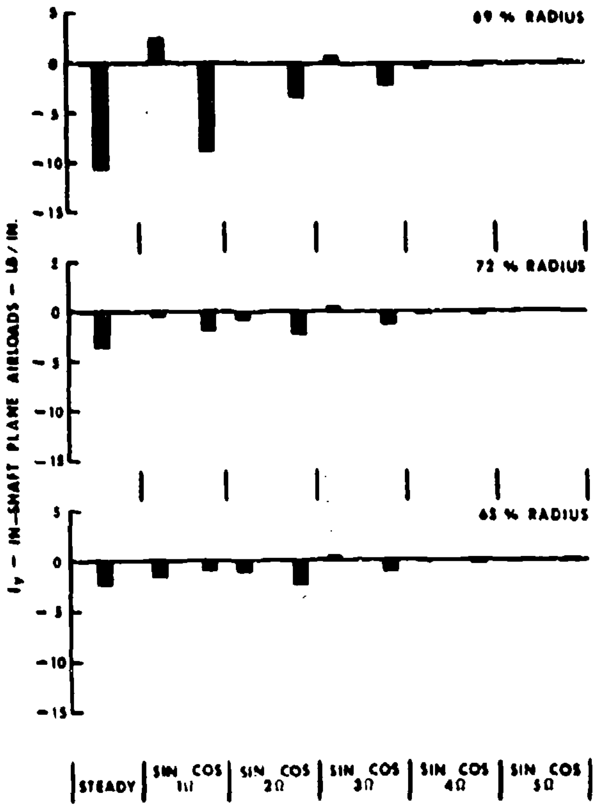

Figure 66. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 180 Knots; n_z = 1.0; Case No. 770-73.

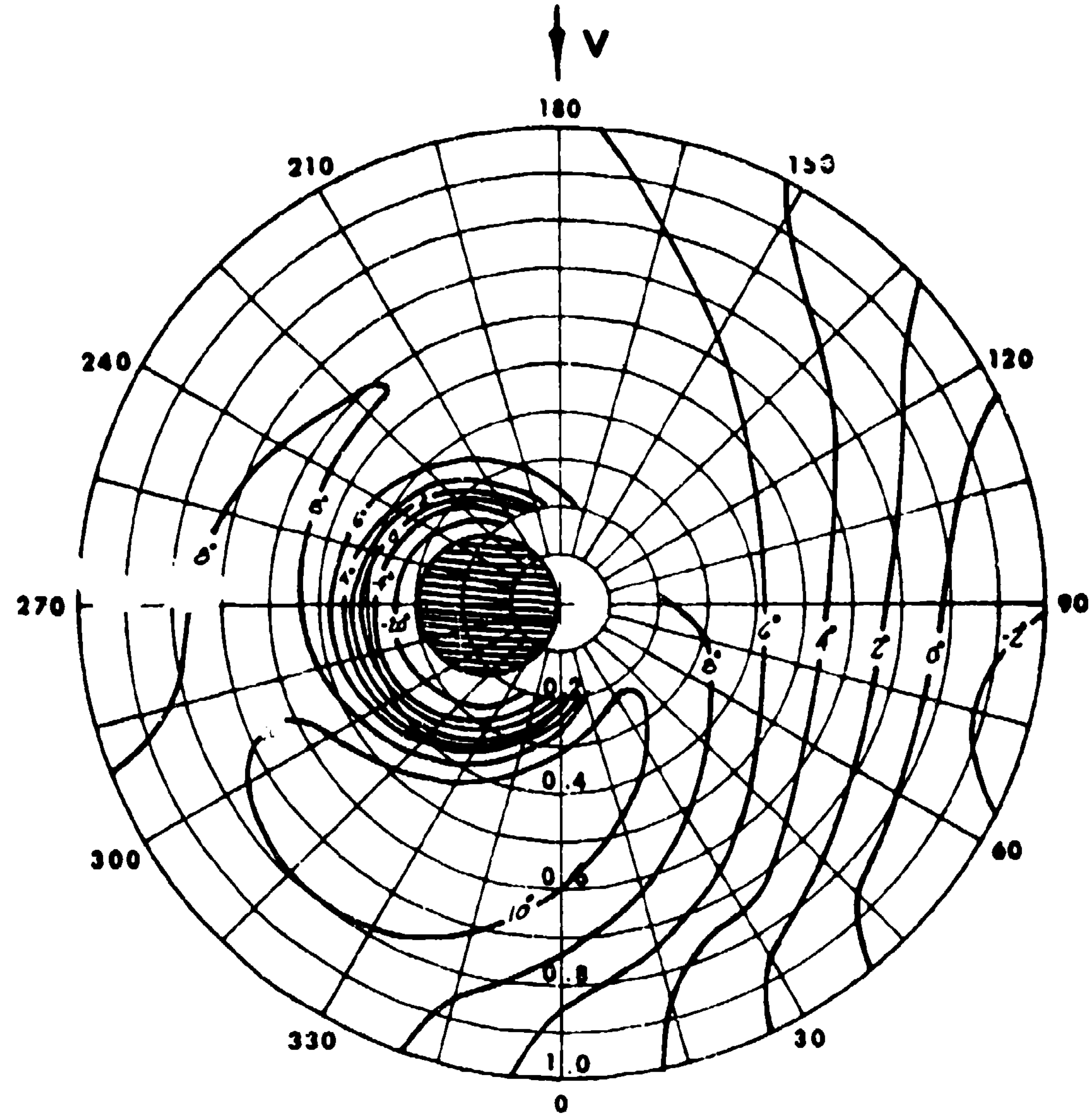

Figure 67. Angle-of-Attack Contours for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.83; Case No. 776-8.

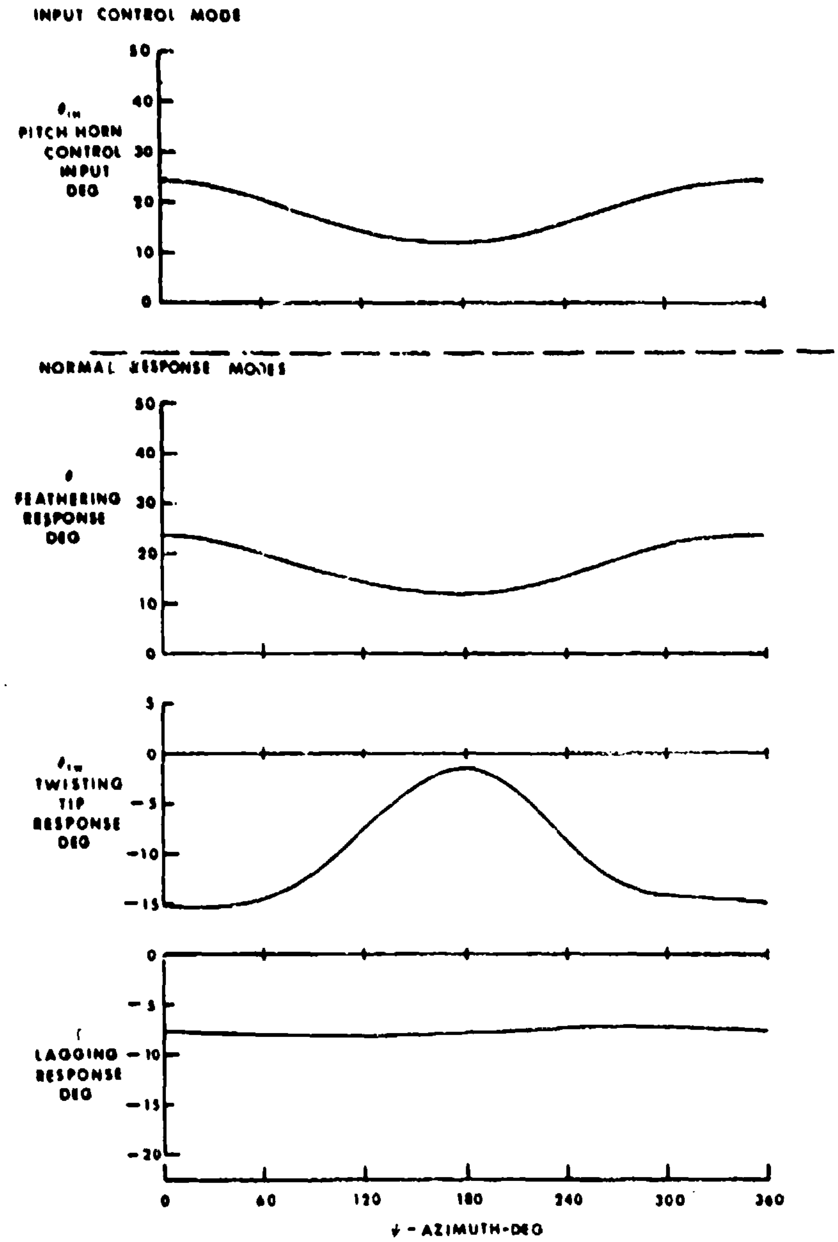

Figure 68. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; η_z = 1.83; Case No. 776-8.

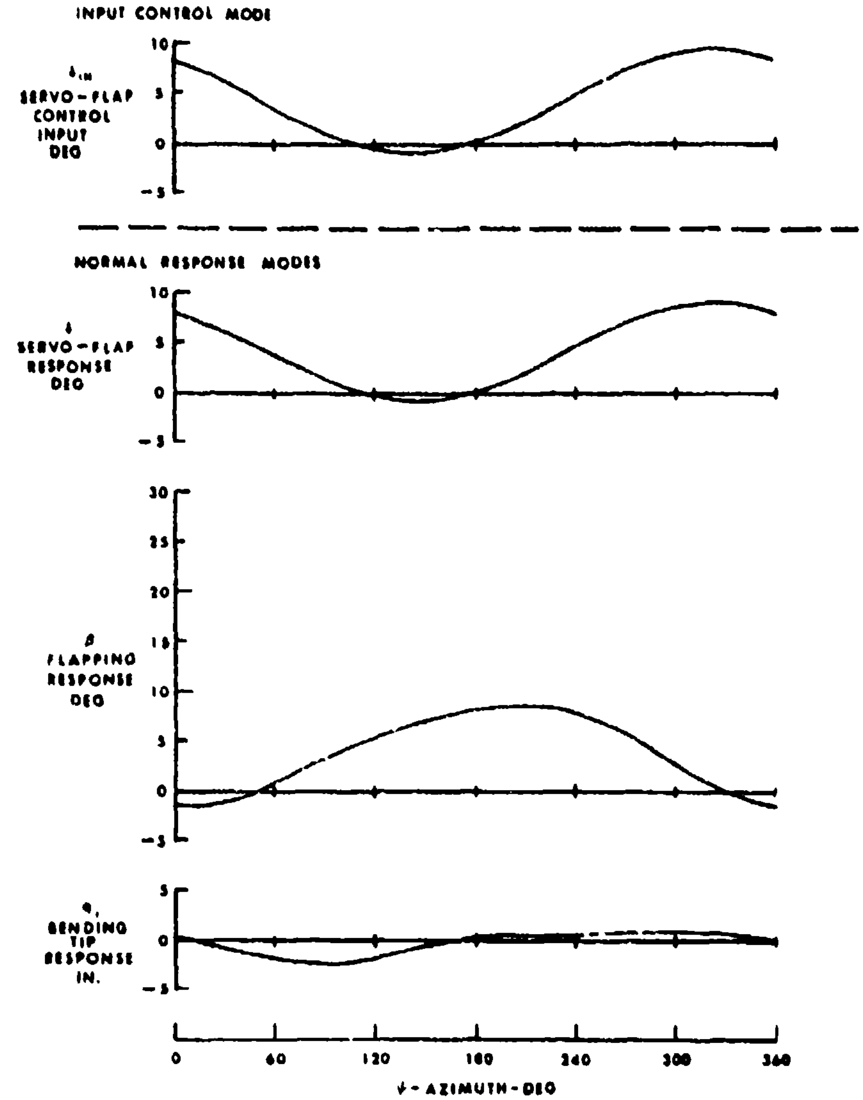

Figure 68 - Concluded

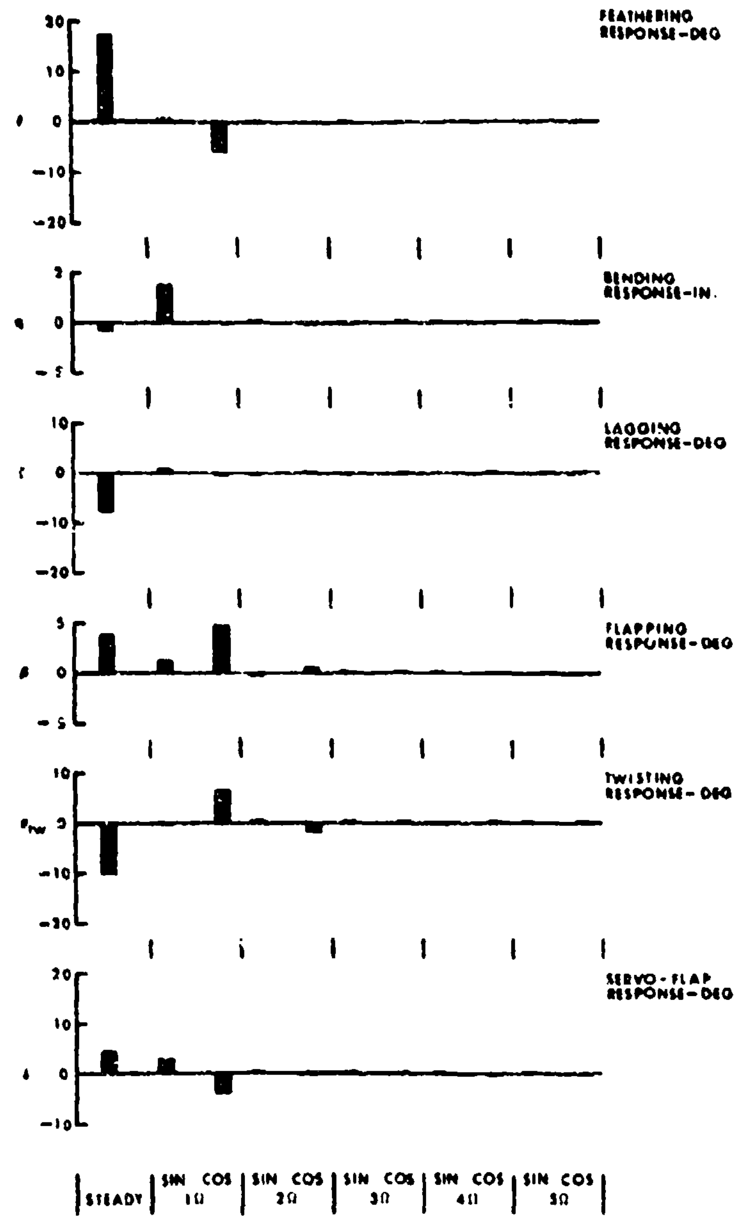

Figure 69. Normal Response Mode Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.83; Case No. 776-8.

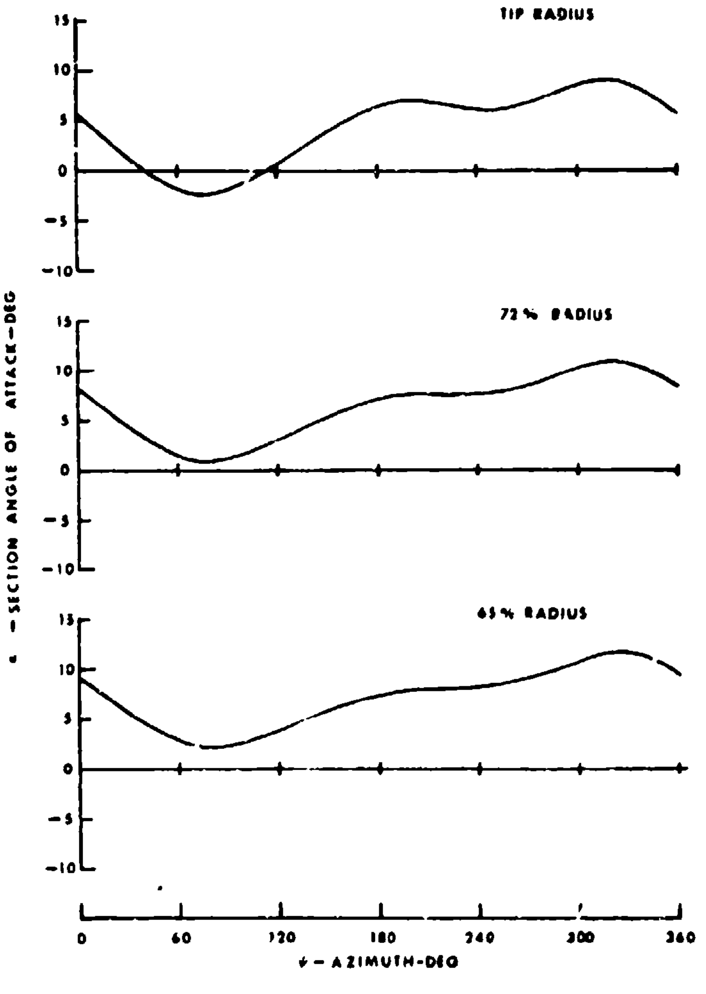

Figure 70. Angle-of-Attack Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.83; Case No. 776-8.

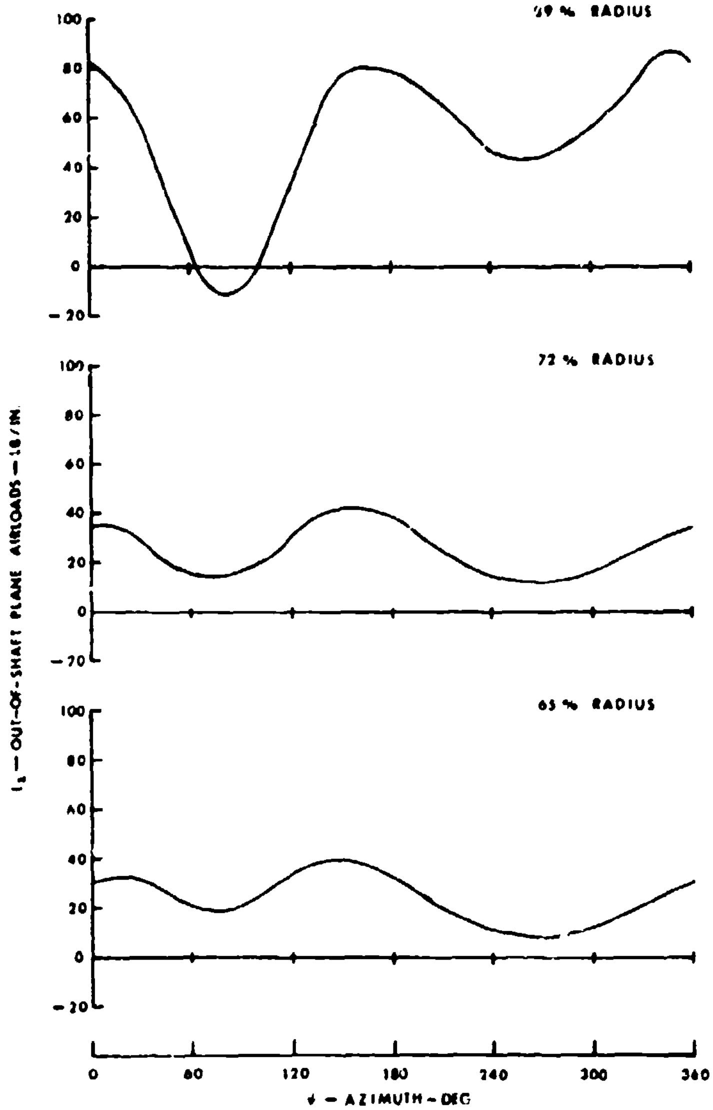

Figure 71. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; η_z = 1.83; Case No. 776-8.

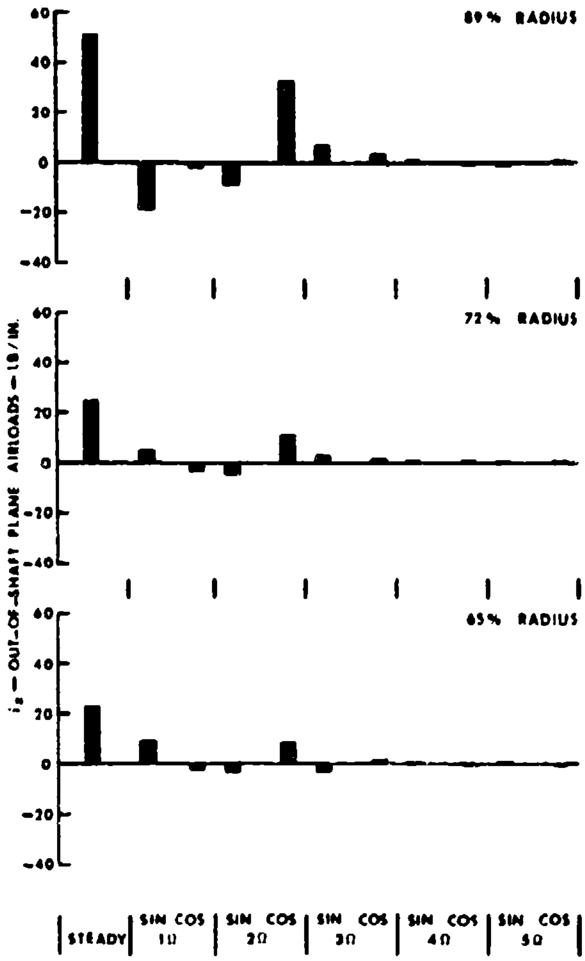

Figure 72. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.83; Case No. 776-8.

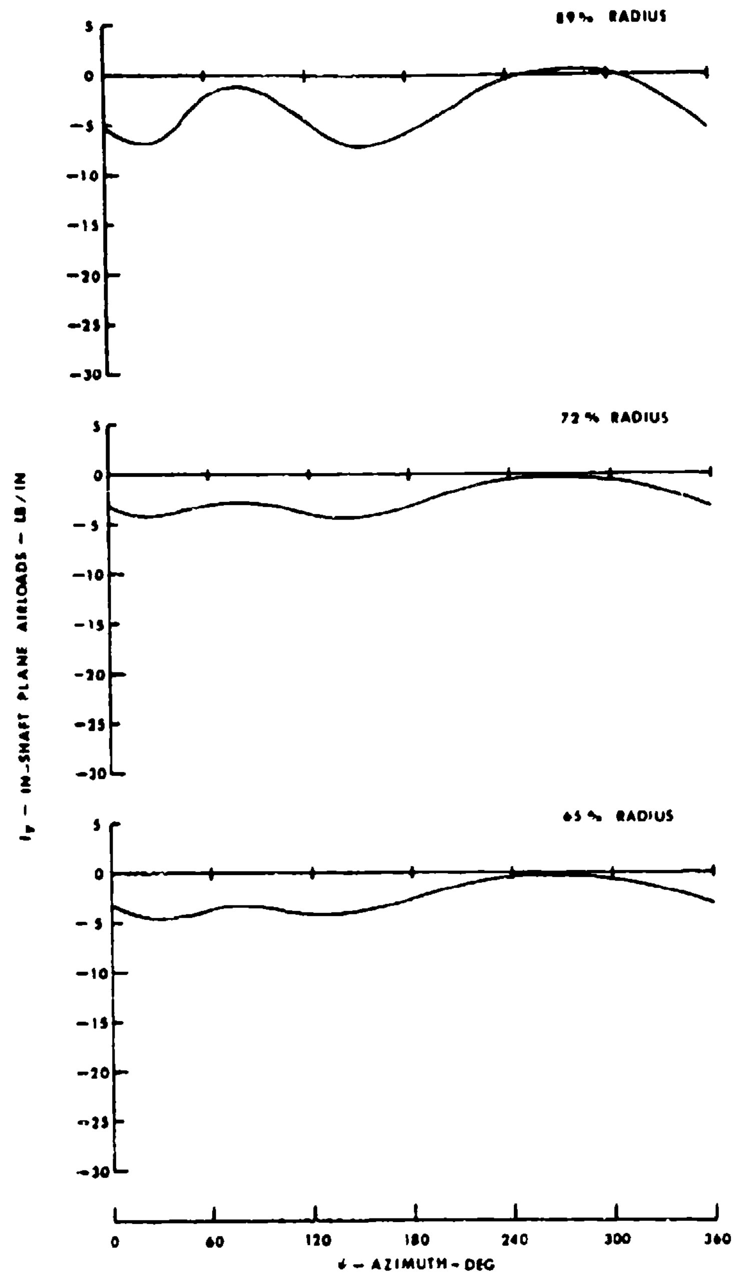

Figure 73. In-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.83; Case No. 776-8.

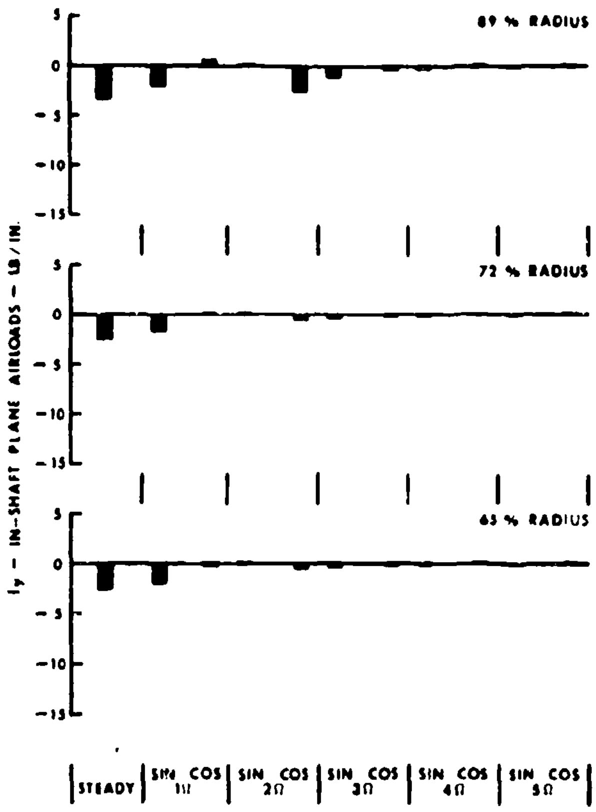

Figure 74. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 120 Knots; n_z = 1.83; Case No. 776-8.

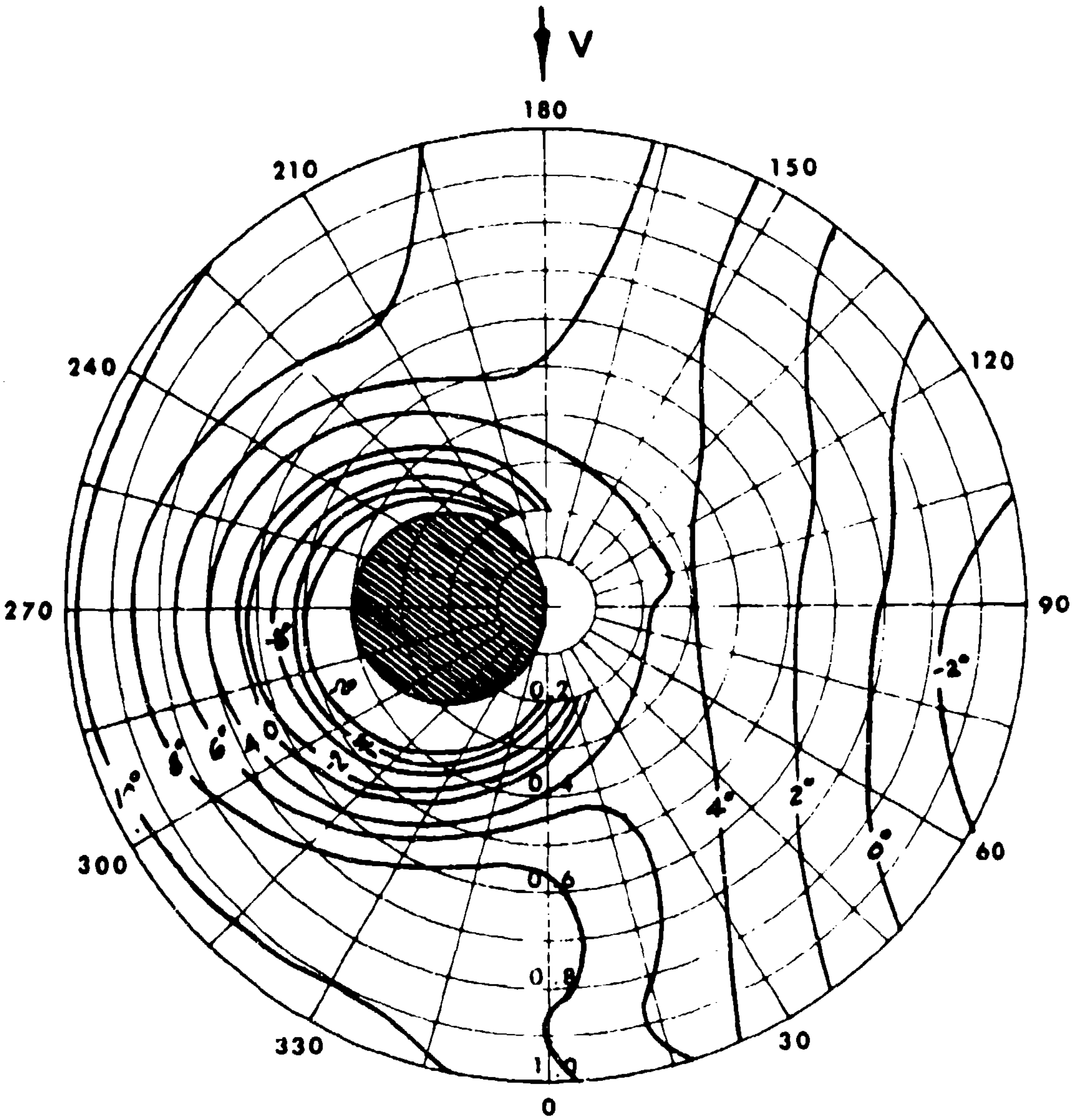

Figure 75. Angle-of-Attack Contours for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.35; Case No. 777-20.

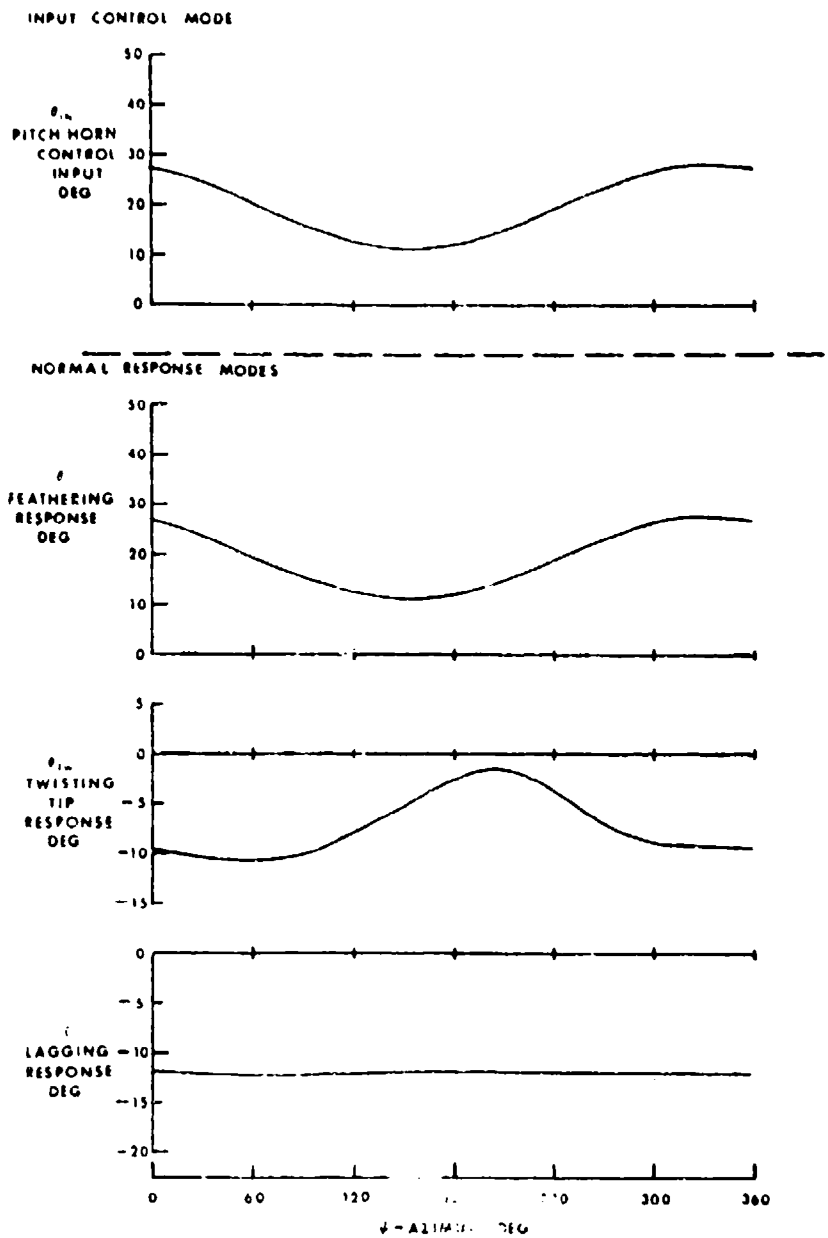

Figure 76. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.35; Case No. 777-20.

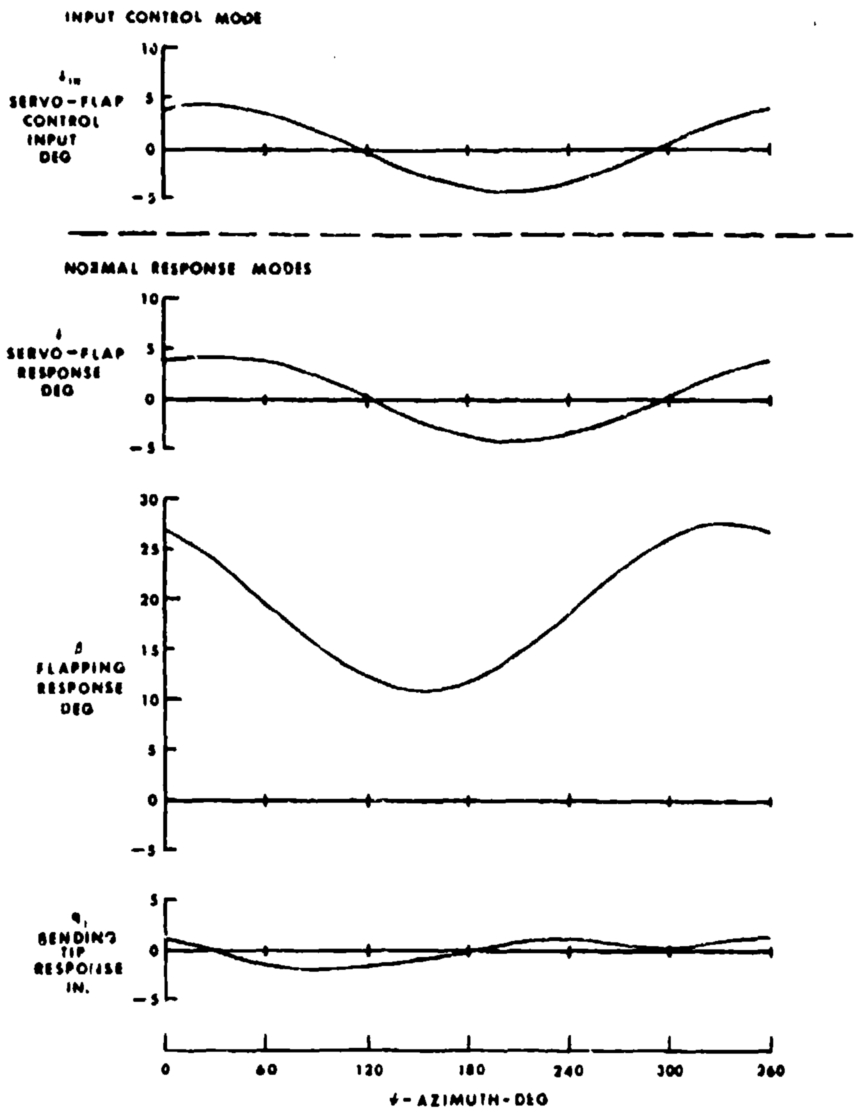

Figure 76 - Concluded

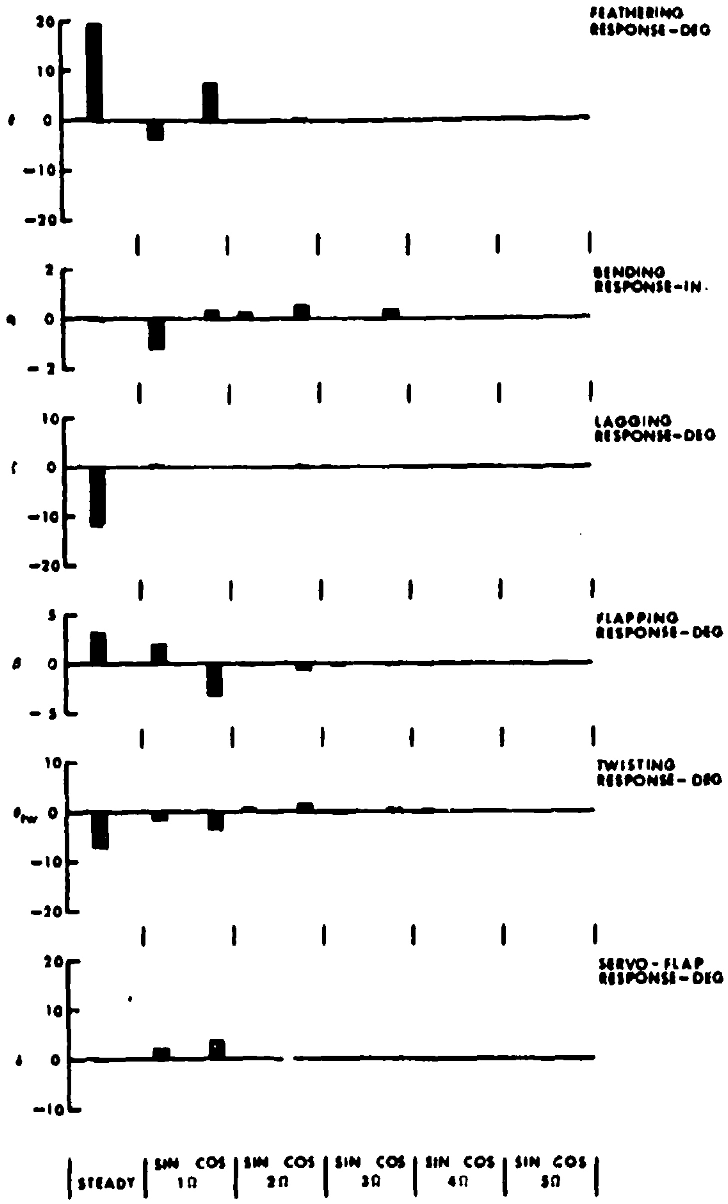

Figure 77. Normal Response Mode Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 160 Knots; η_z = 1.35; Case No. 777-20.

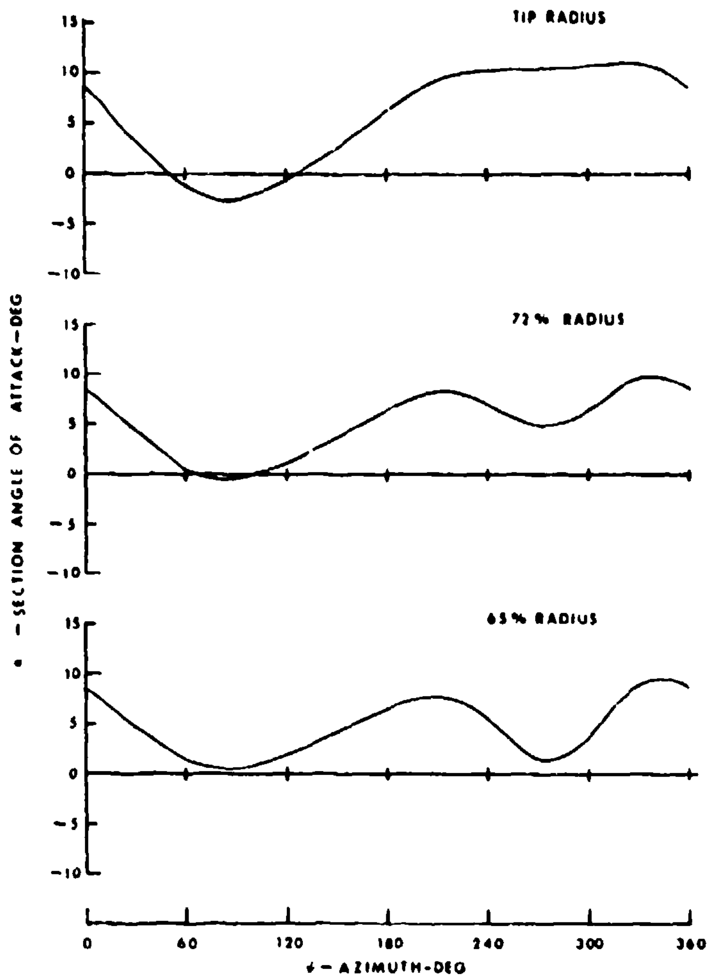

Figure 78. Angle-of-Attack Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; $\eta_z = 1.35$; Case No. 777-20.

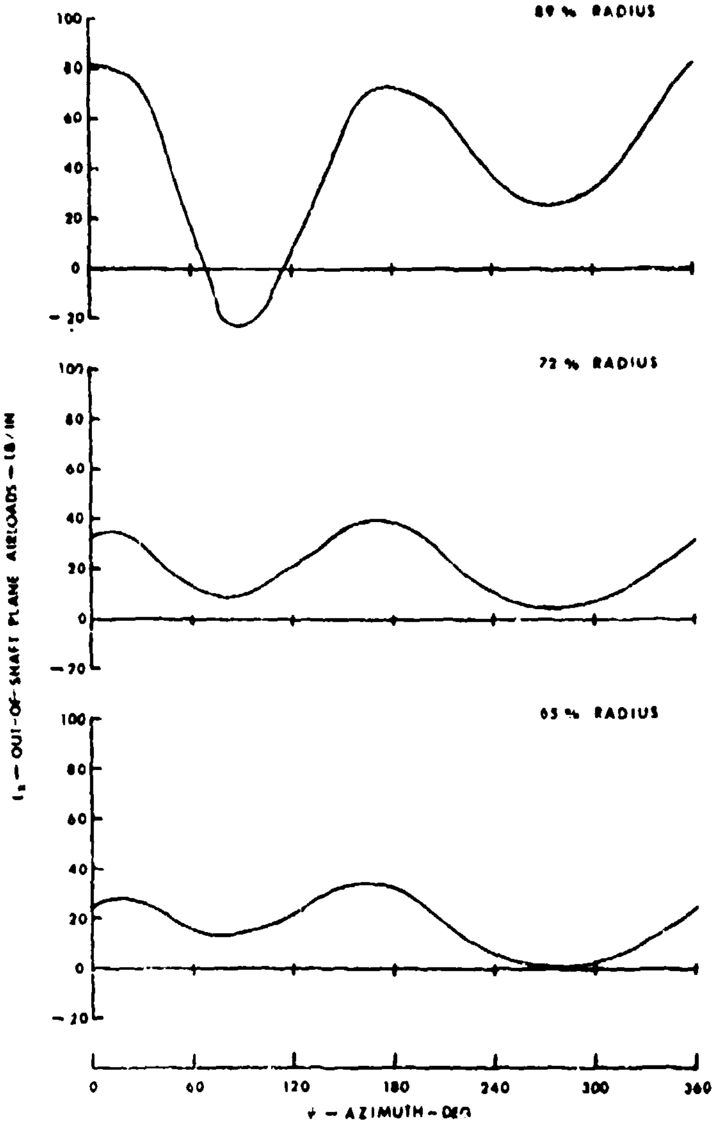

Figure 79. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.35; Case No. 777-20.

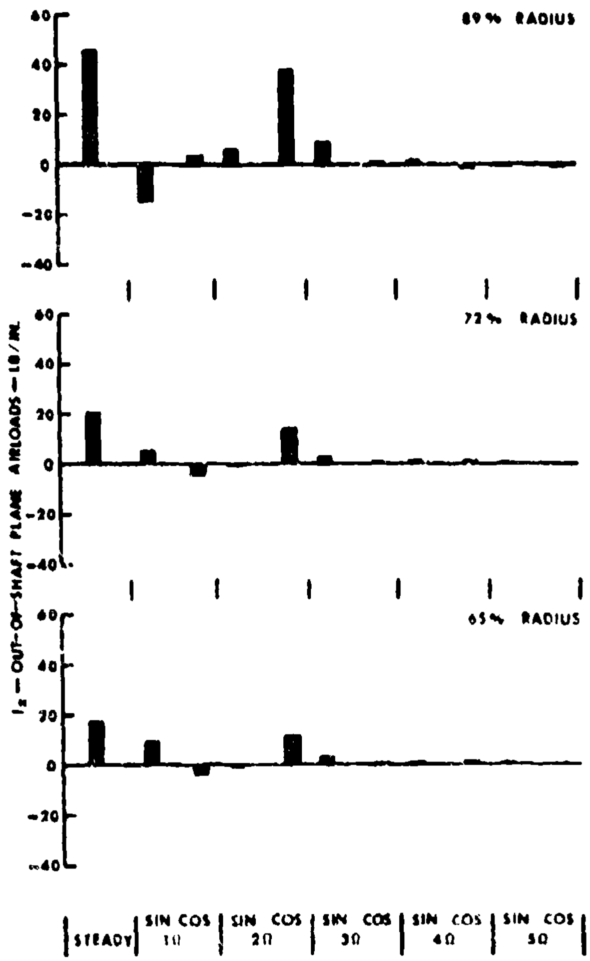

Figure 80. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 160 Knots; n_z = 1.35; Case No. 777-20.

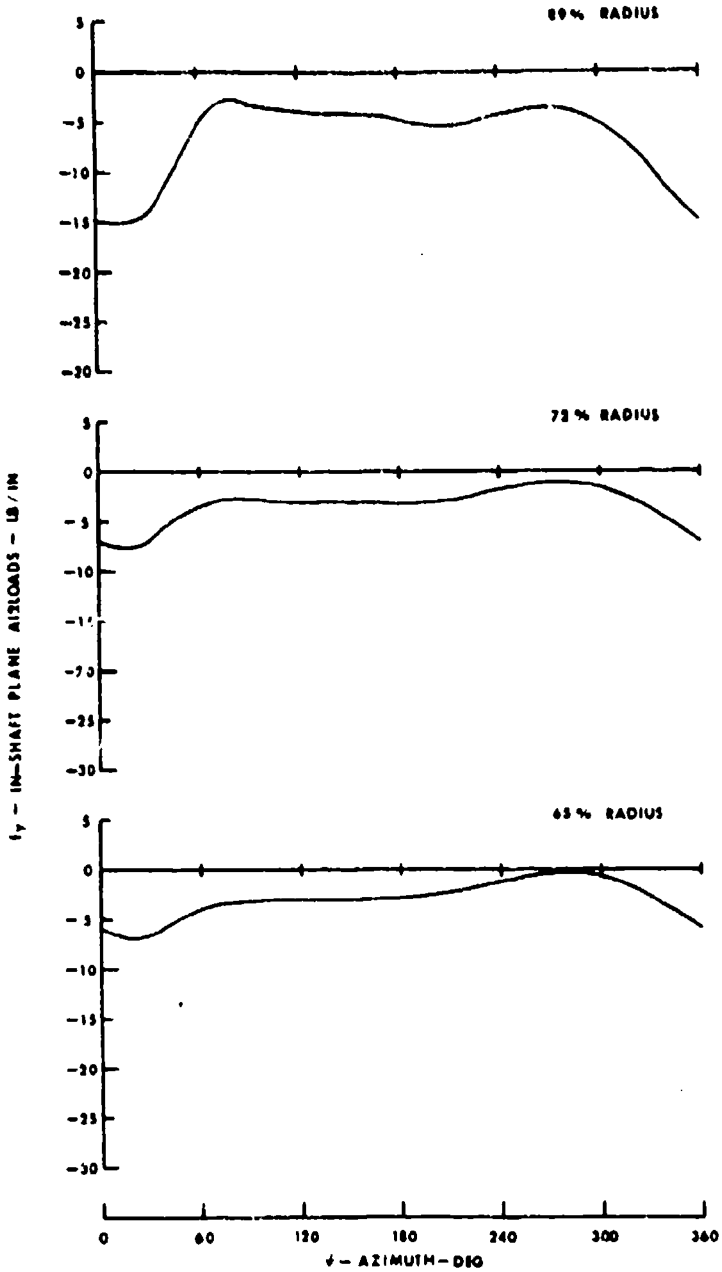

Figure 81. In-Shaft Plane Airload Time Histories for the 4-Bladed CTR-G Configuration; V = 160 Knots; η_z = 1.35; Case No. 777-20.

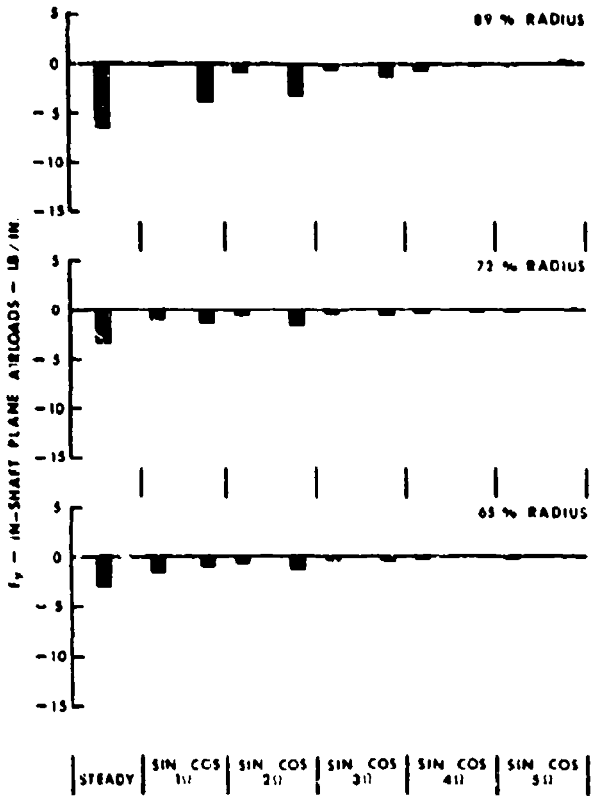

Figure 82. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed CTR-G Configuration; V = 160 Knots; η_z = 1.35; Case No. 777-20.

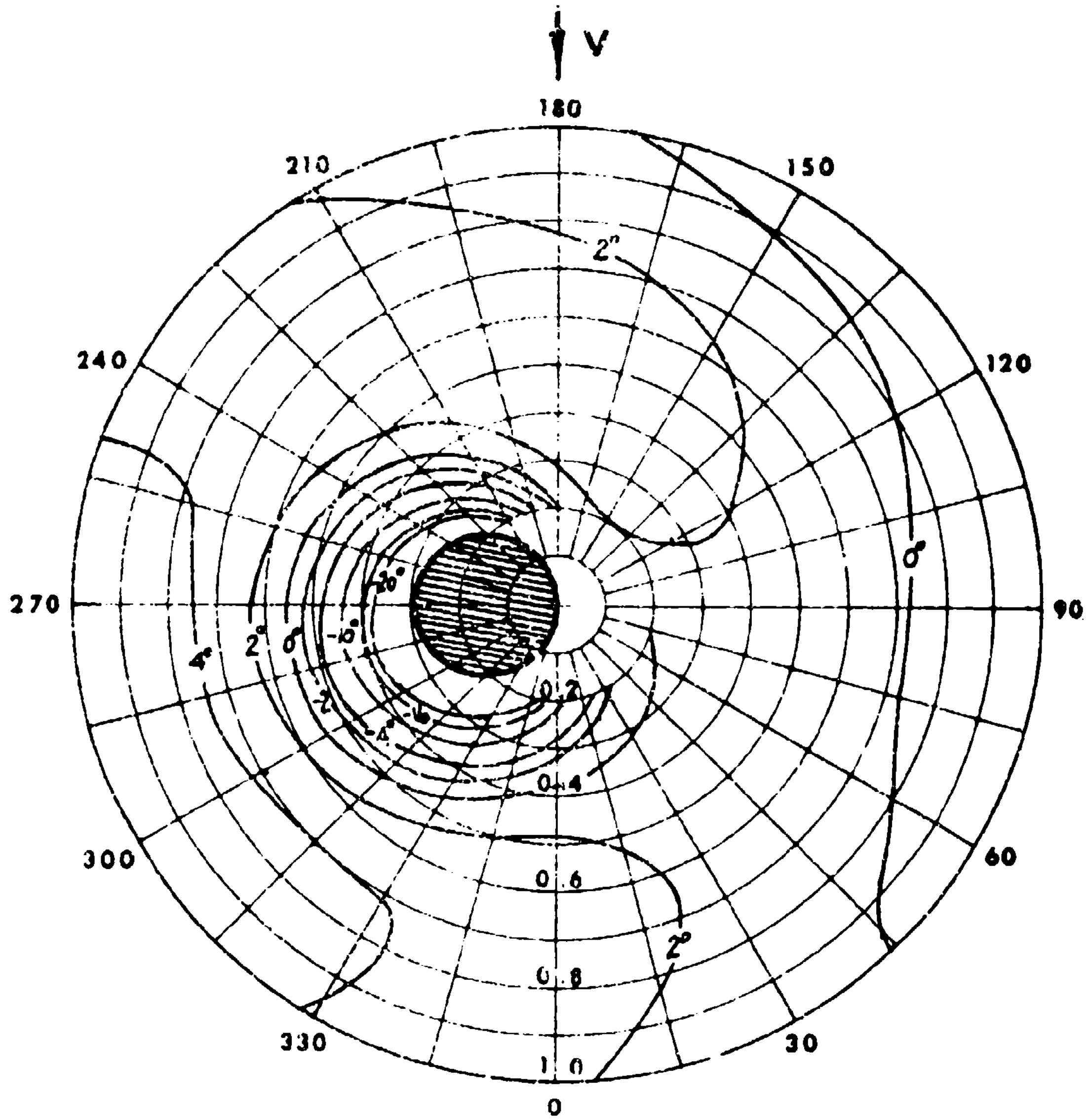

Figure 83. Angle-of-Attack Contours for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.0; Case No. 554-AJ.

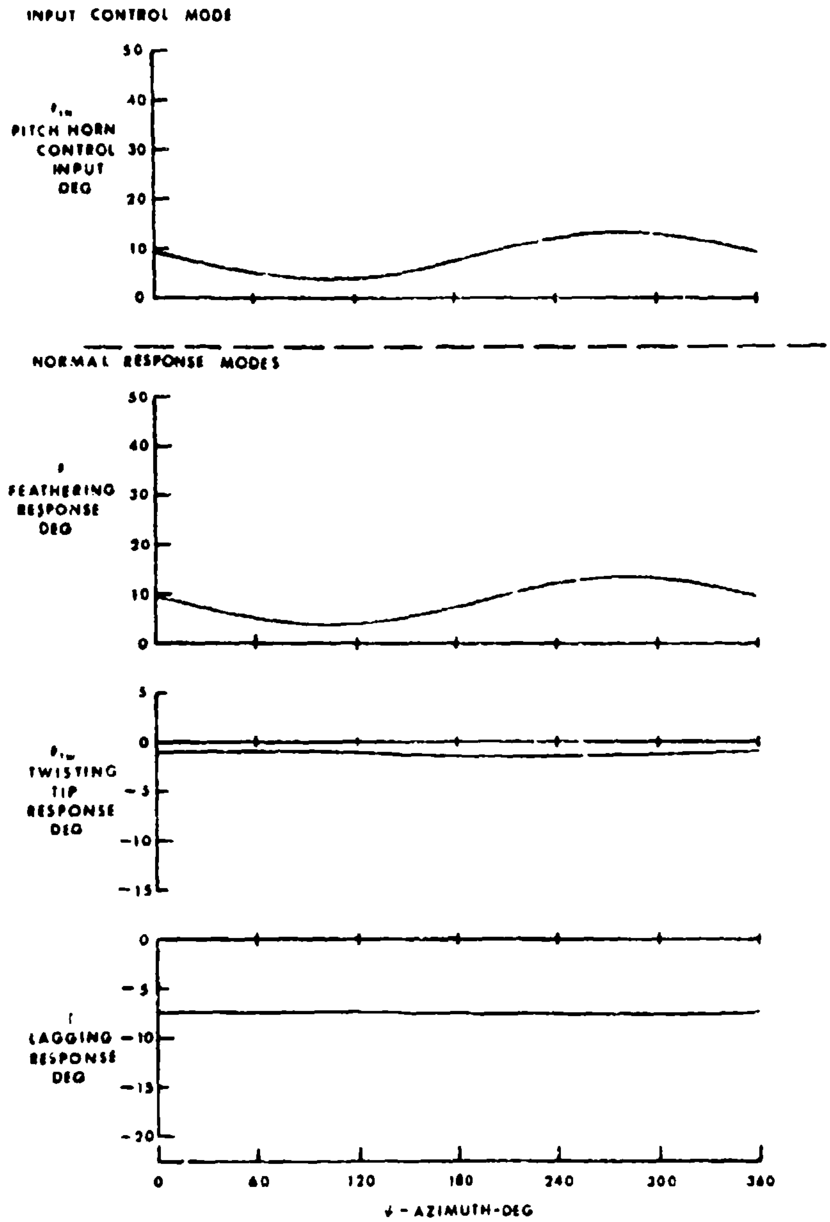

Figure 84. Input Control Modes and Normal Response Mode Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.0; Case No. 554-A1.

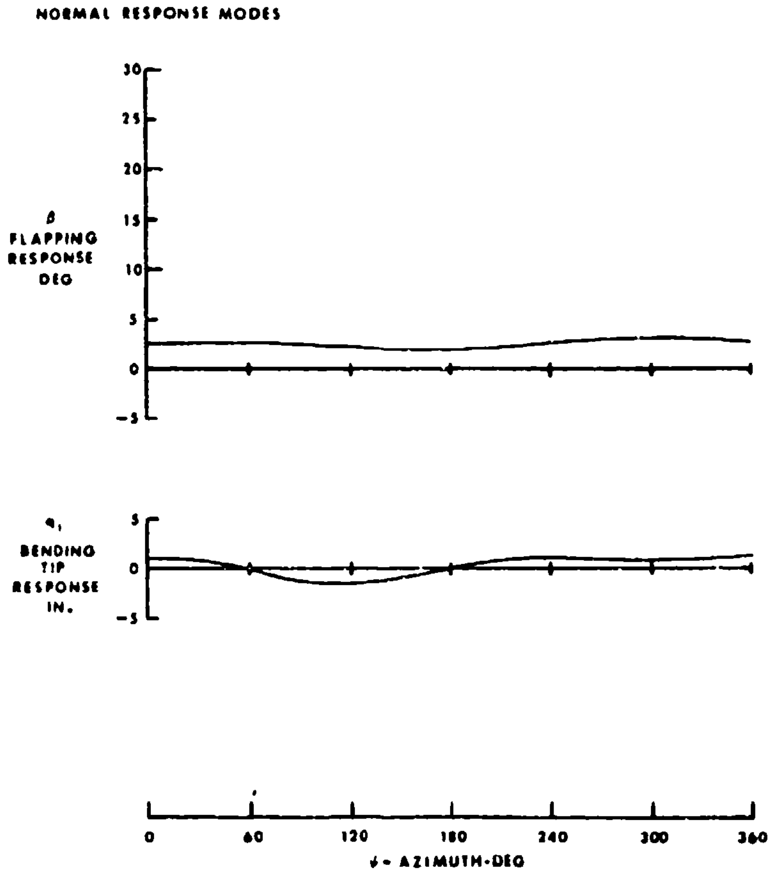

Figure 84 - Concluded

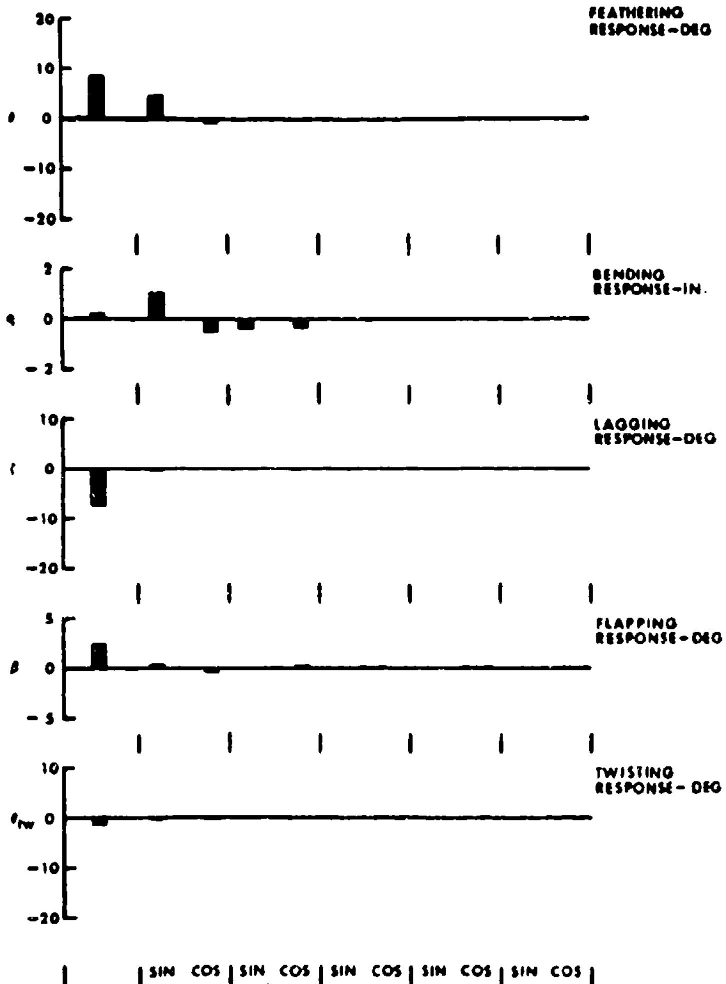

Figure 85. Normal Response Mode Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.0; Case No. 554-A1.

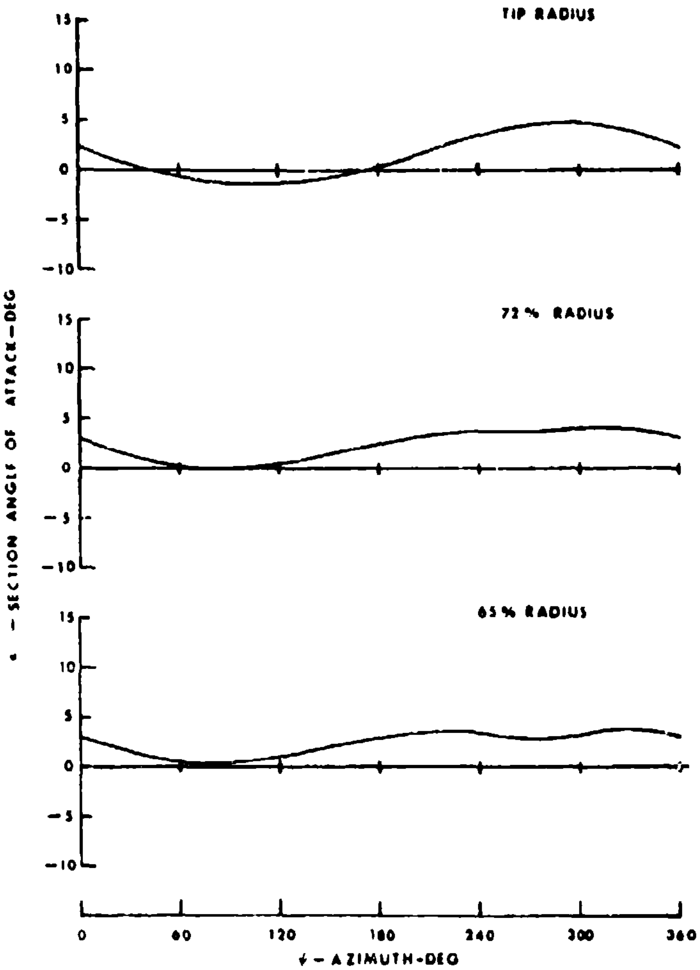

Figure 86. Angle-of-Attack Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.0; Case No. 554-A1.

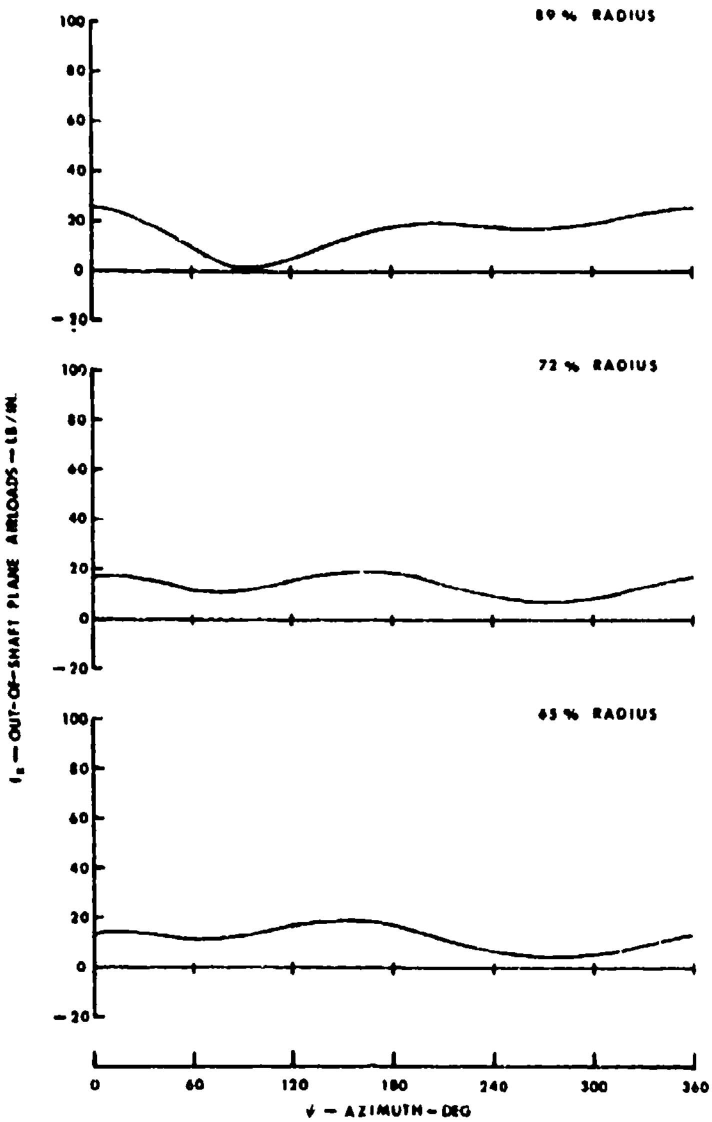

Figure 87. Out-of-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.0; Case No. 554-A1.

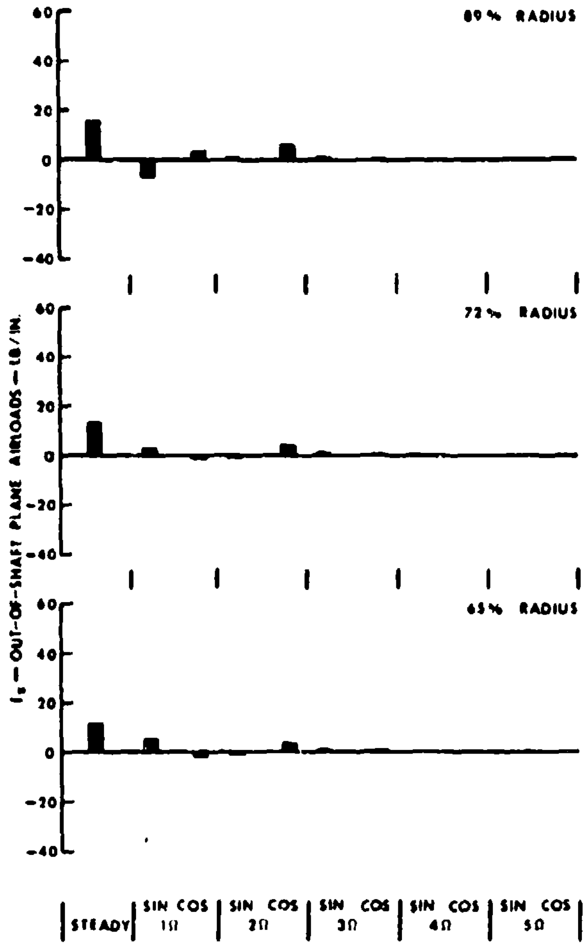

Figure 88. Out-of-Shaft Plane Airloads Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 120 Knots; η_z = 1.0; Case No. 554-A1.

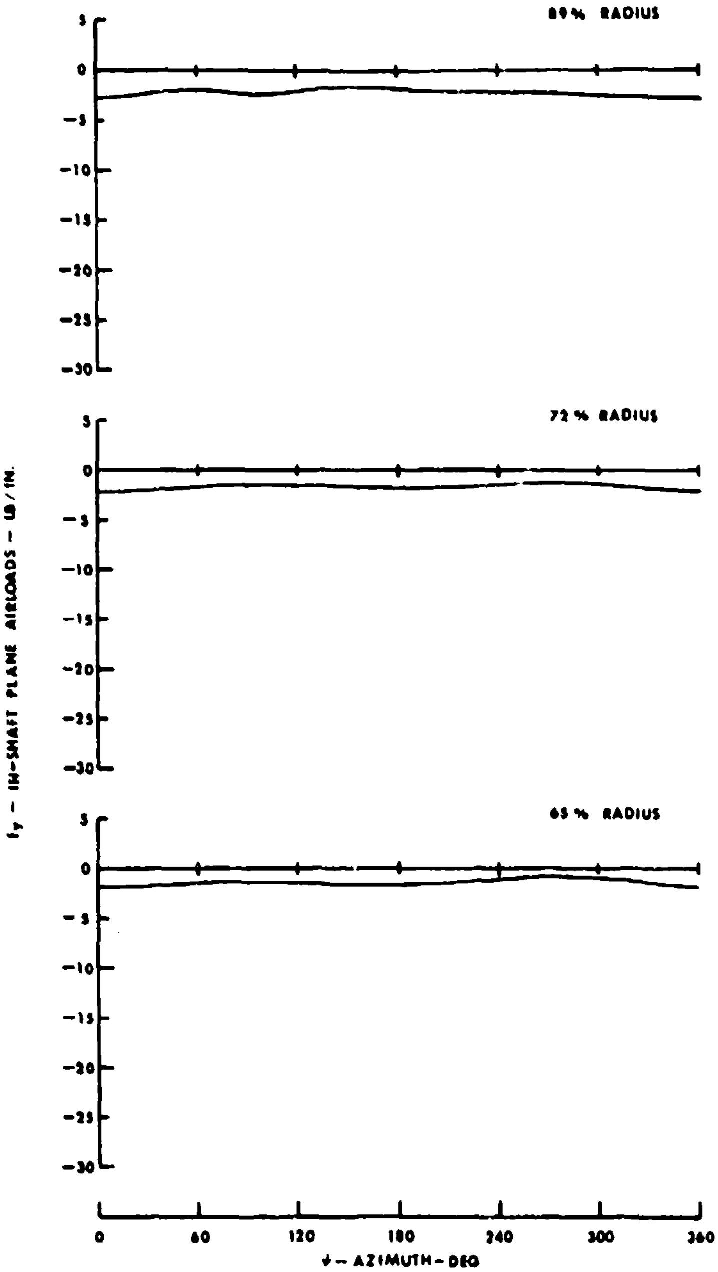

Figure 89. In-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.0; Case No. 554-A1.

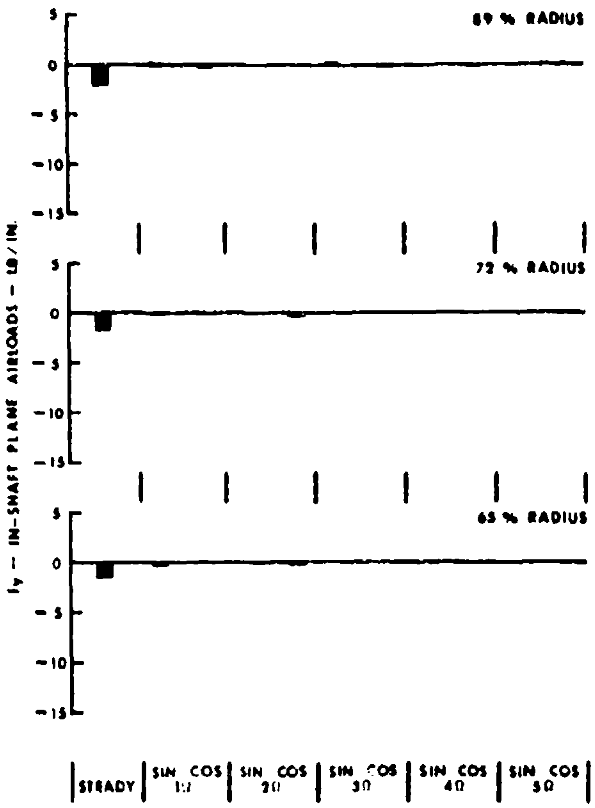

Figure 90. In-Shaft Plane Airload Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 120 Knots; η_z = 1.0; Case No. 554-A1.

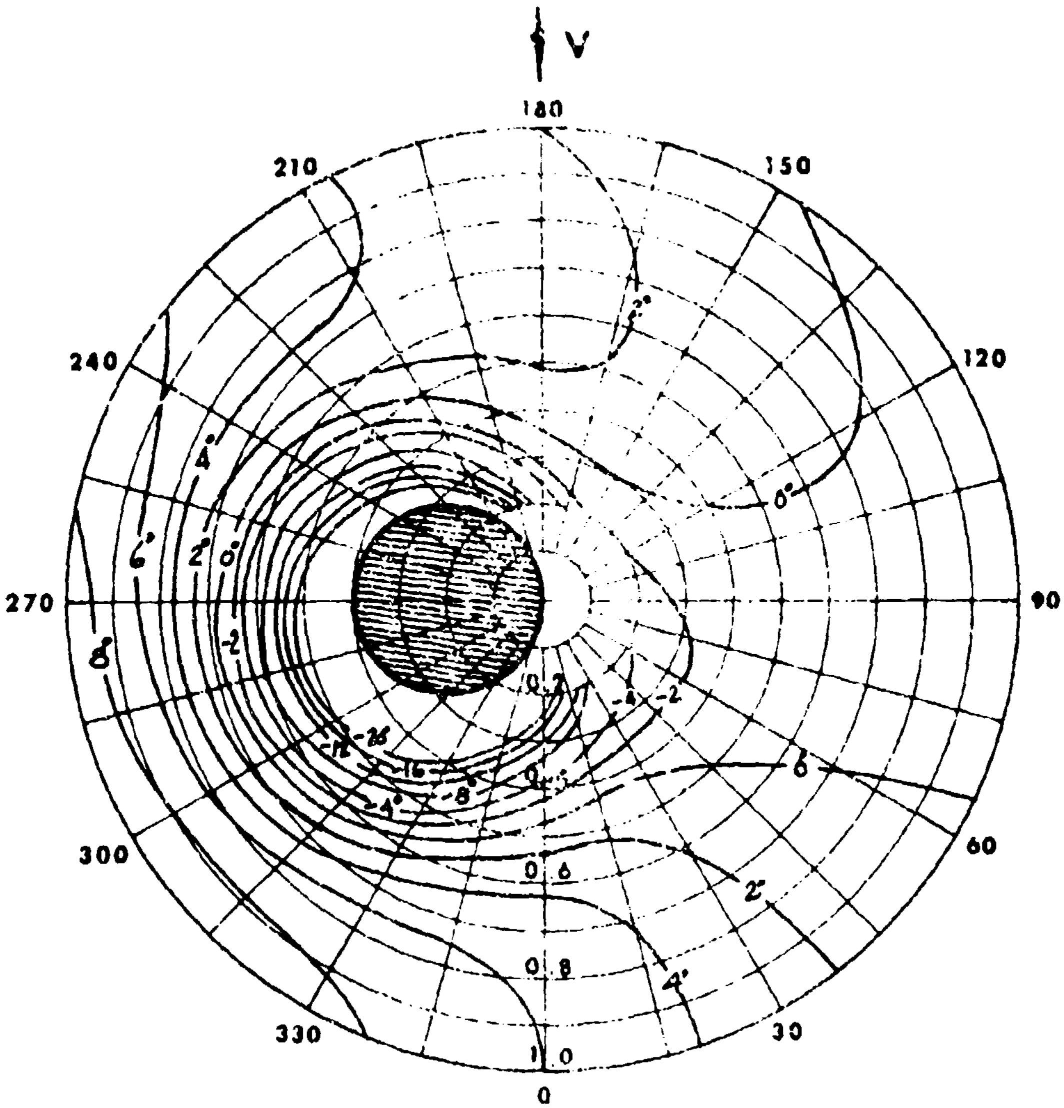

Figure 91. Angle-of-Attack Contours for the 6-Bladed DCR&3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 553-A1.

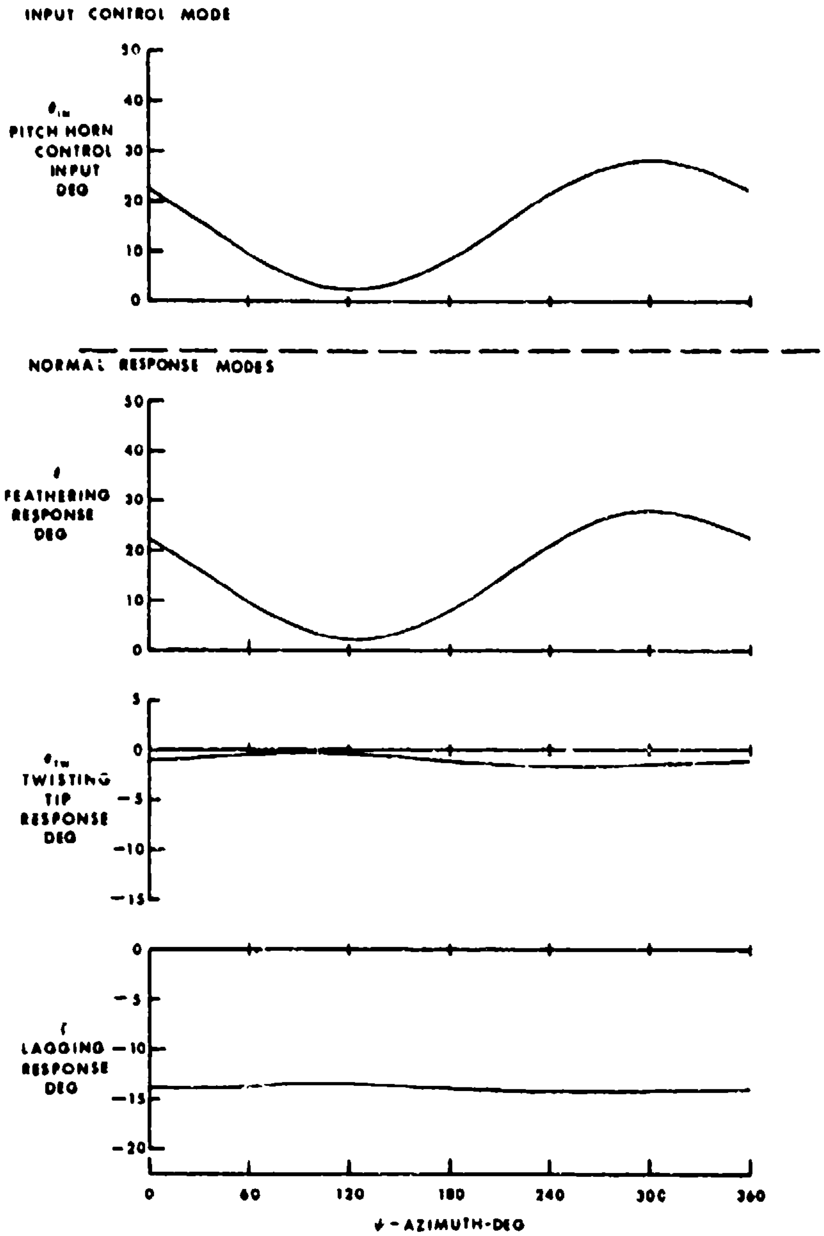

Figure 92. Input Control Modes and Normal R^sponse Mode Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.0; Case No. 552-A1.

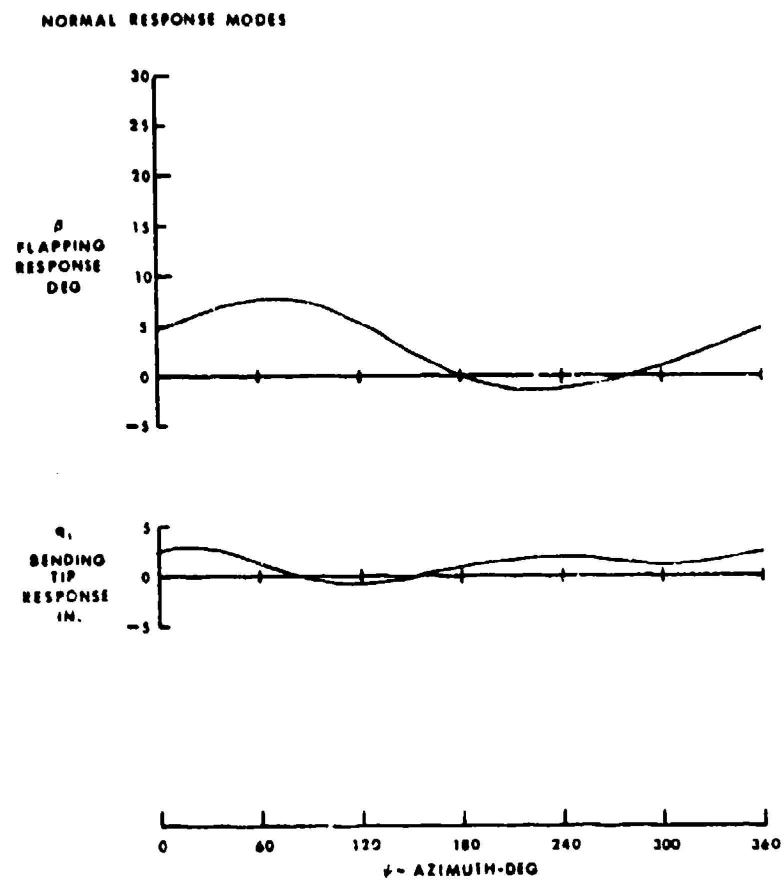

Figure 92 - Concluded

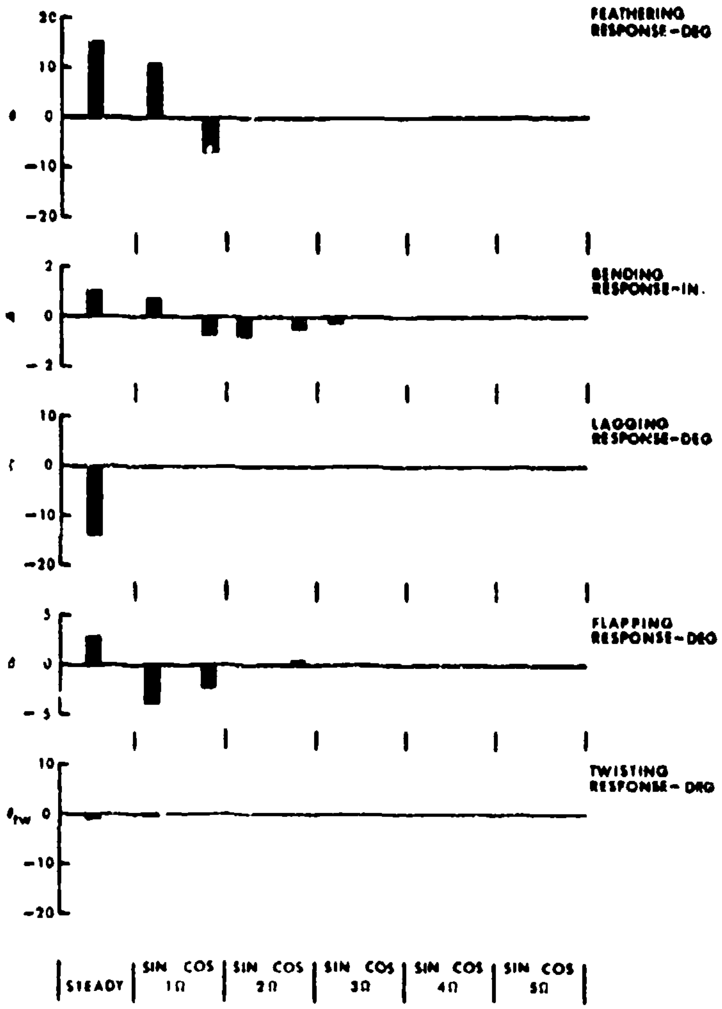

Figure 93. Normal Response Mode Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 552-A1.

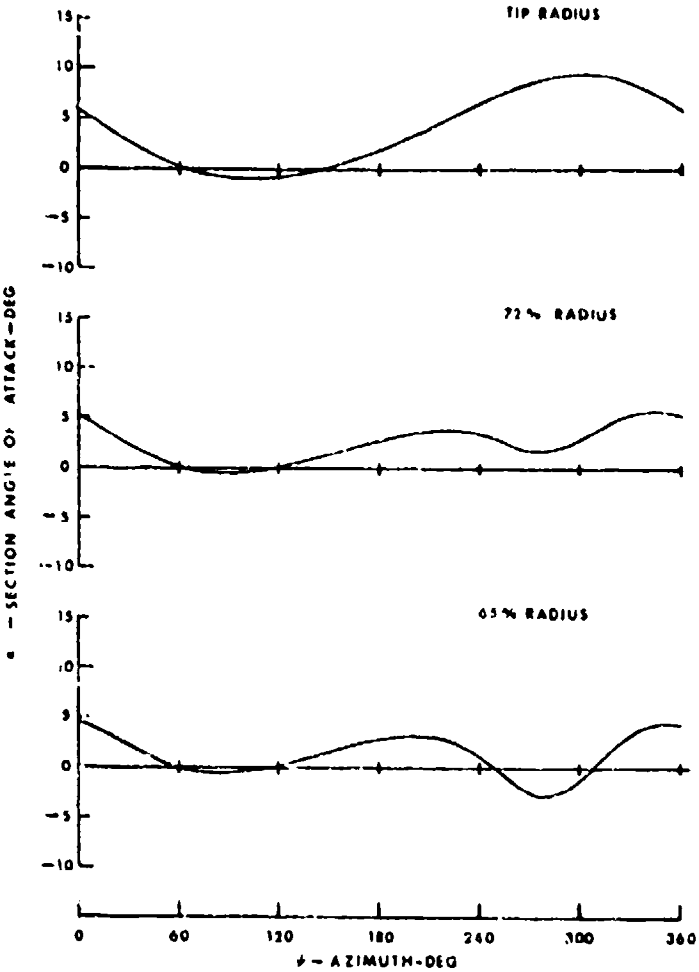

Figure 94. Angle-of-Attack Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.0; Case No. 552-A1.

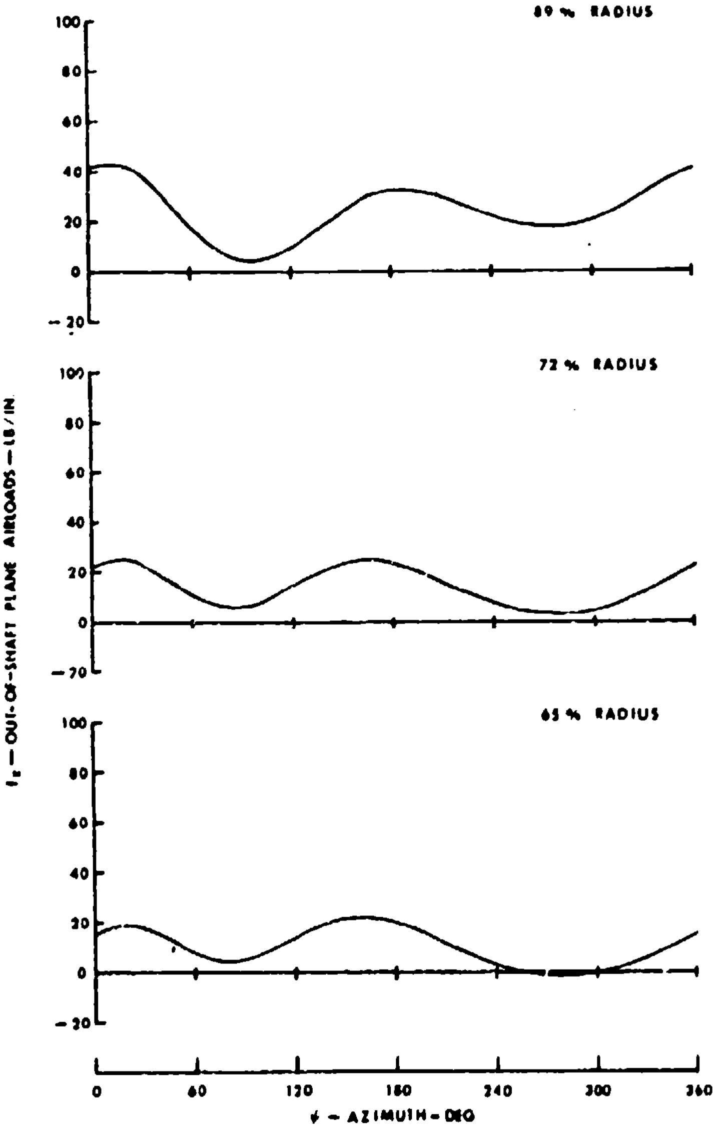

Figure 95. Out-of-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.0; Case No. 552-A1.

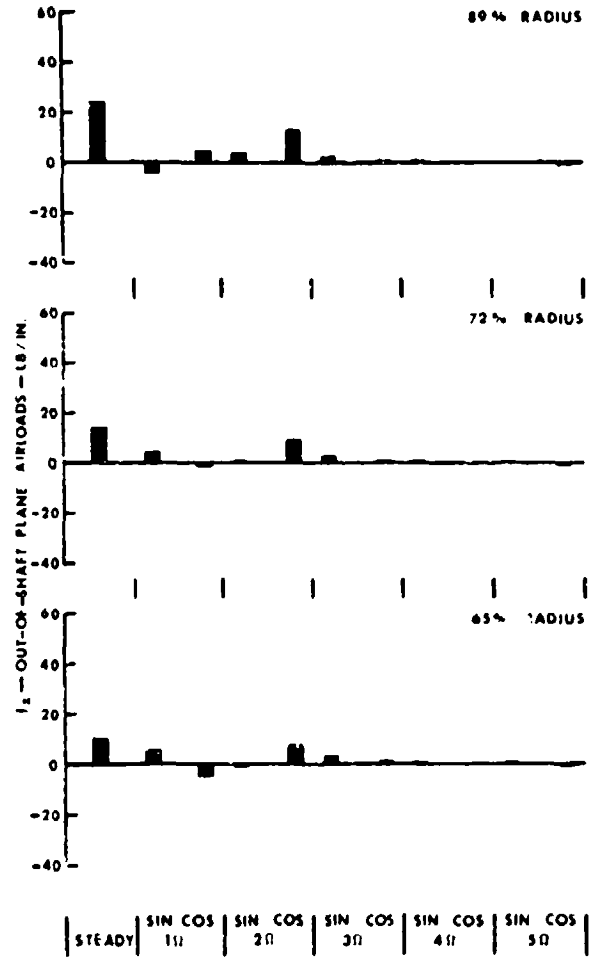

Figure 96. Out-of-Shaft Plane Airloads Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 552-A1.

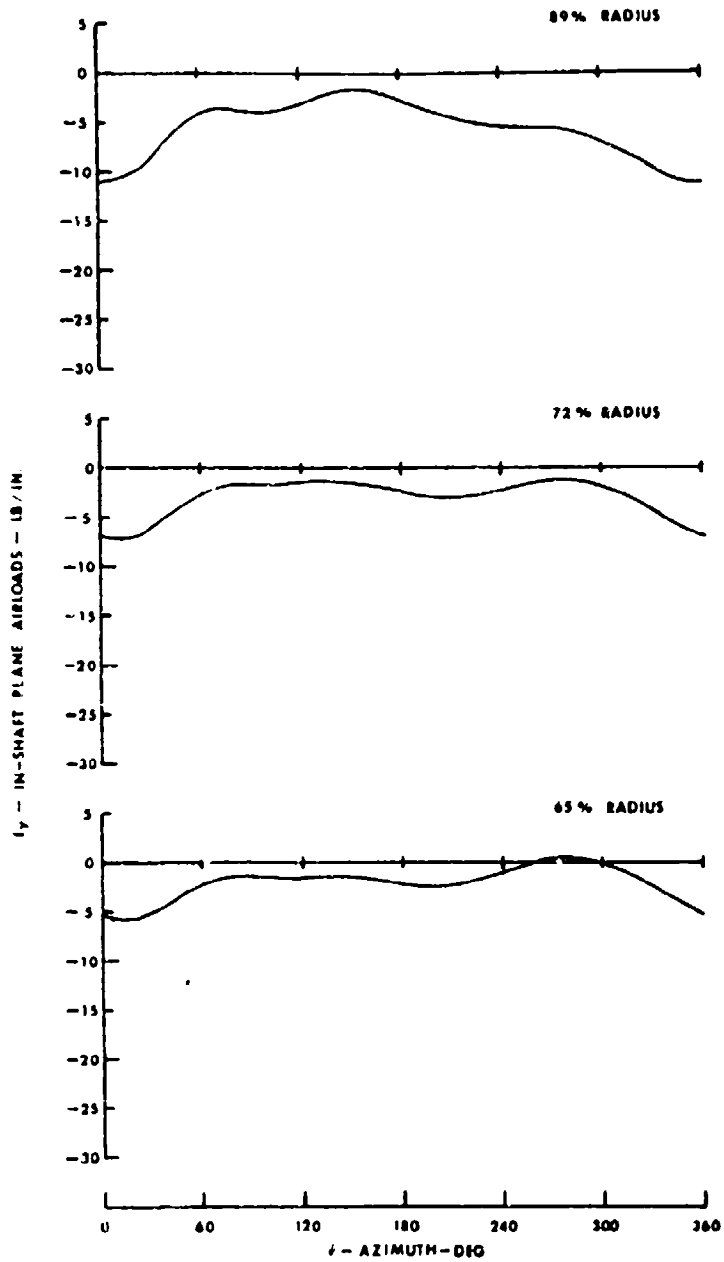

Figure 97. In-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 552-A1.

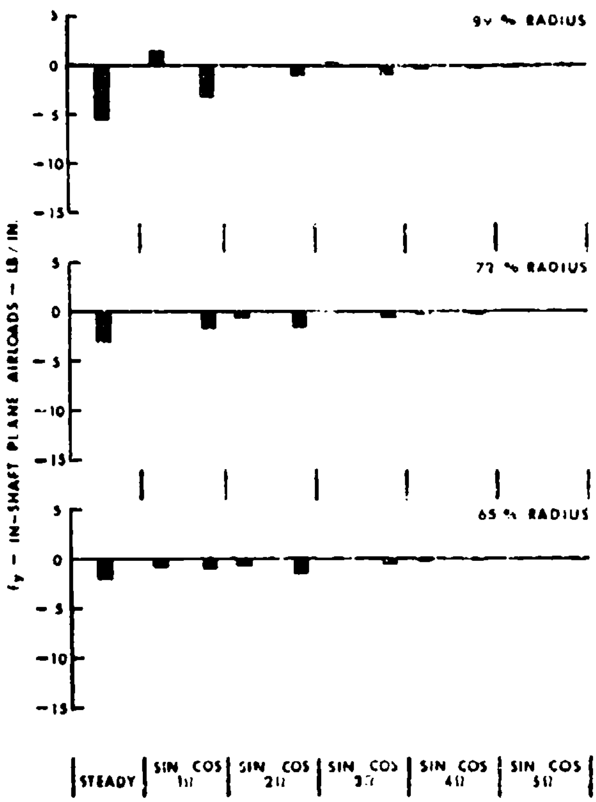

Figure 98. In-Shaft Plane Airload Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 552-A1.

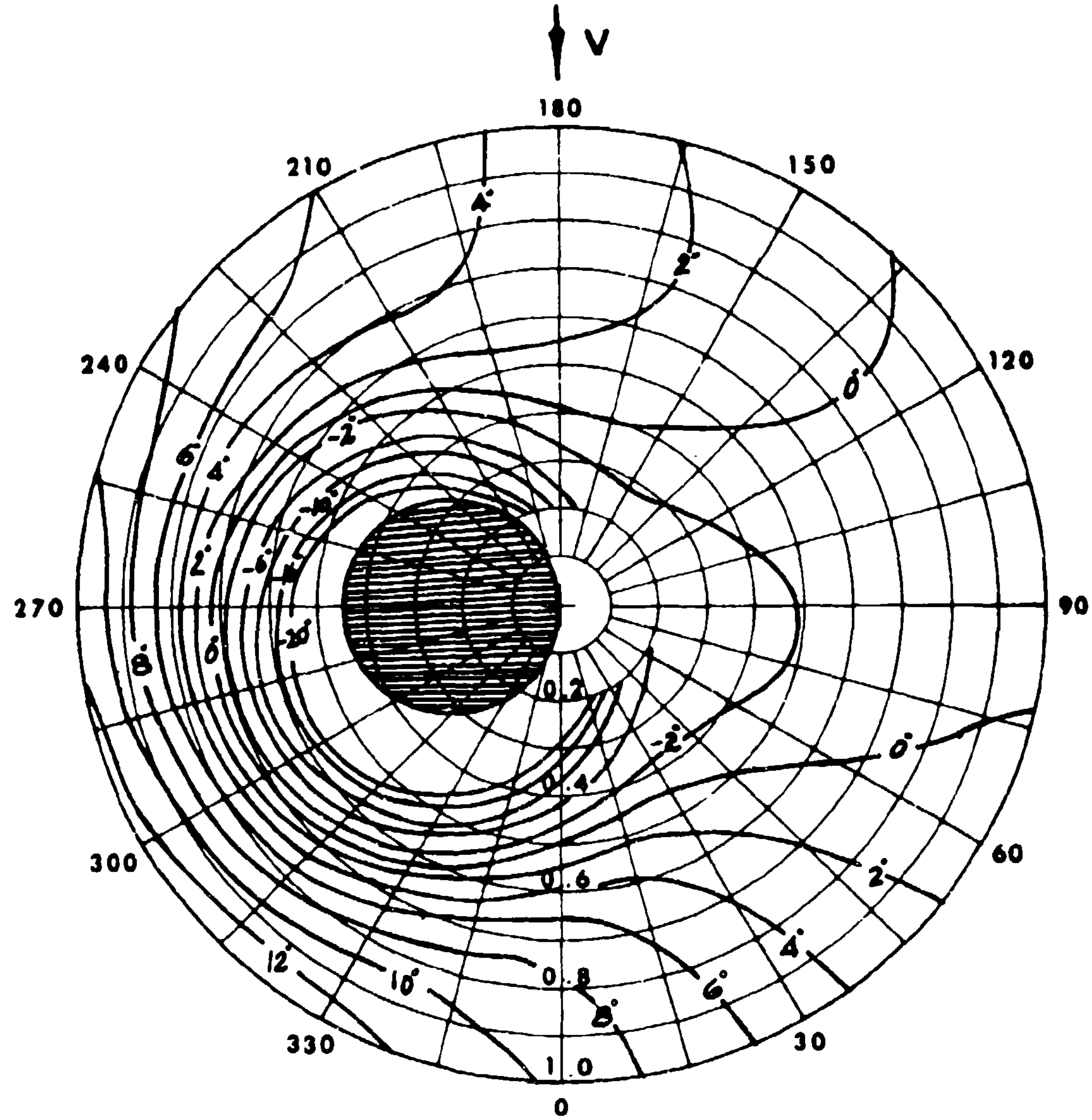

Figure 99. Angle-of-Attack Contours for the 6-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 550-A3.

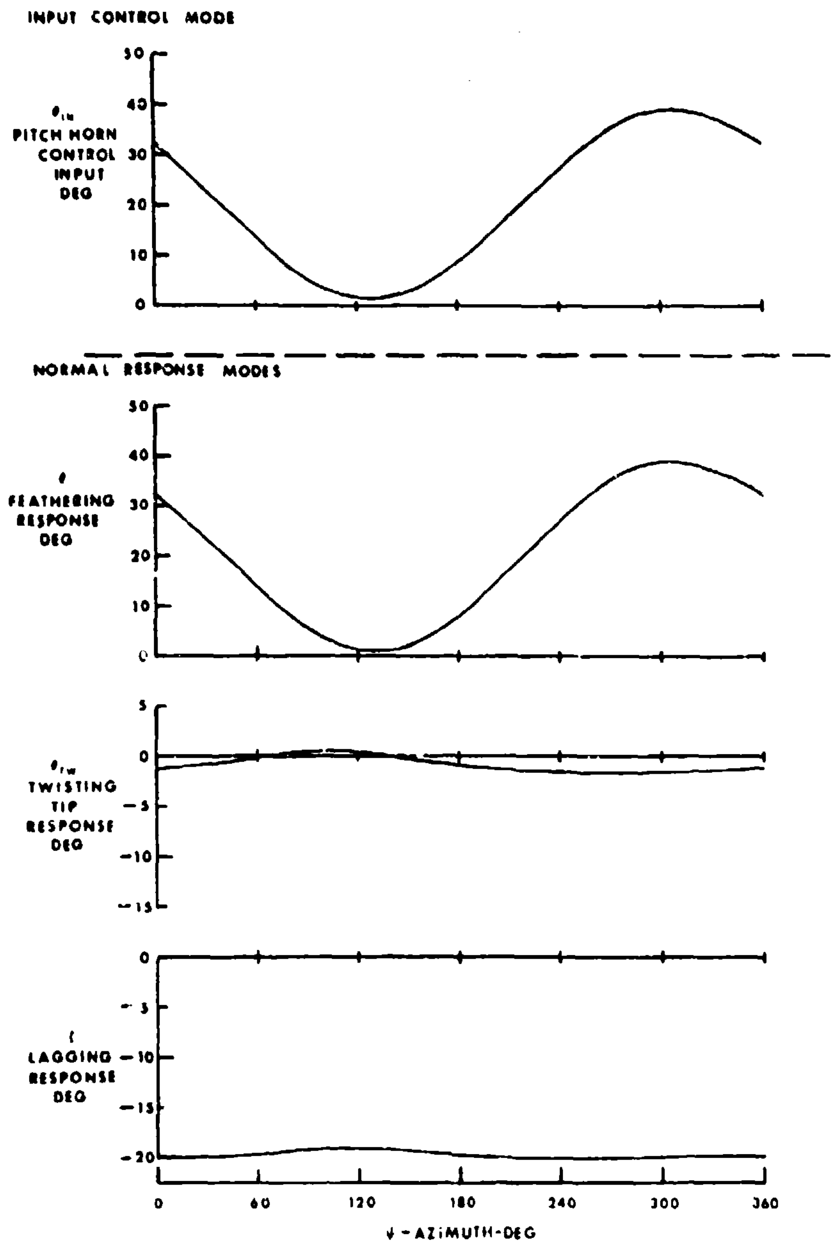

Figure 100. Input Control Modes and Normal Response Mode Time Histories for the 6-Bladed DCRa3 Configuration; V = 180 Knots; η_z = 1.0; Case No. 550-A3.

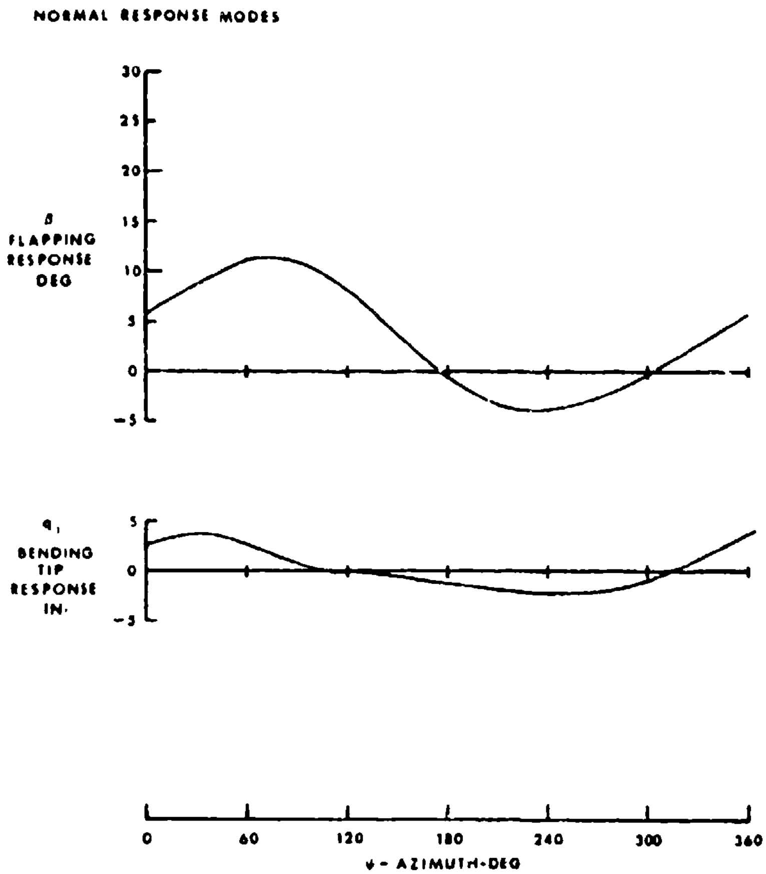

Figure 100 - Concluded

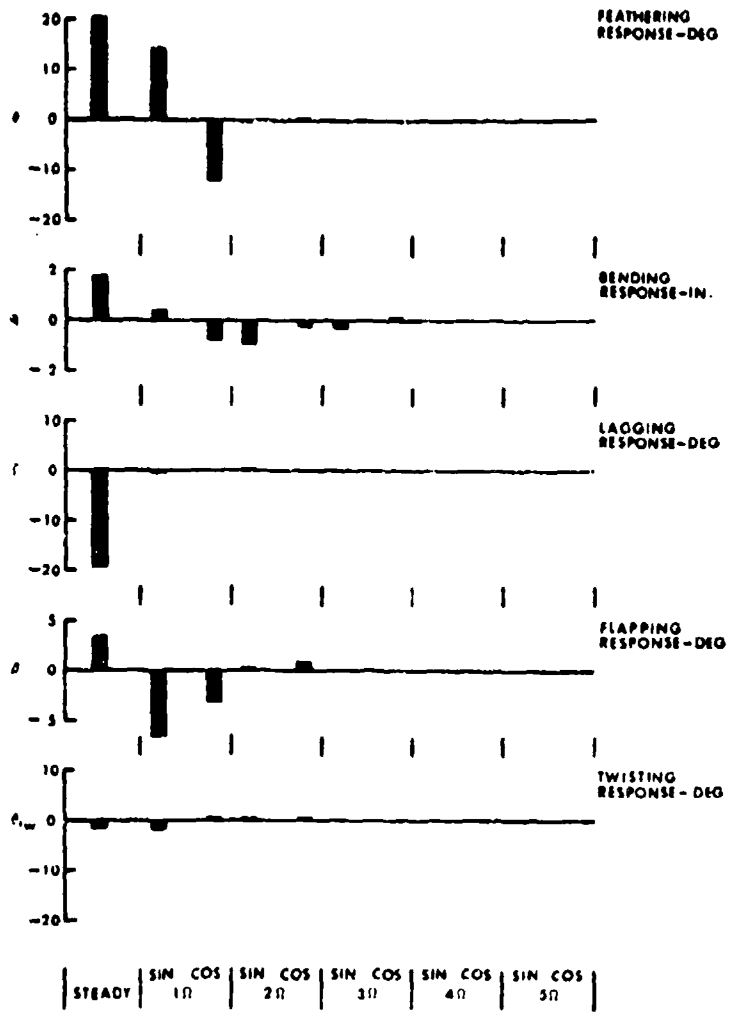

Figure 101. Normal Response Mode Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 550-A3.

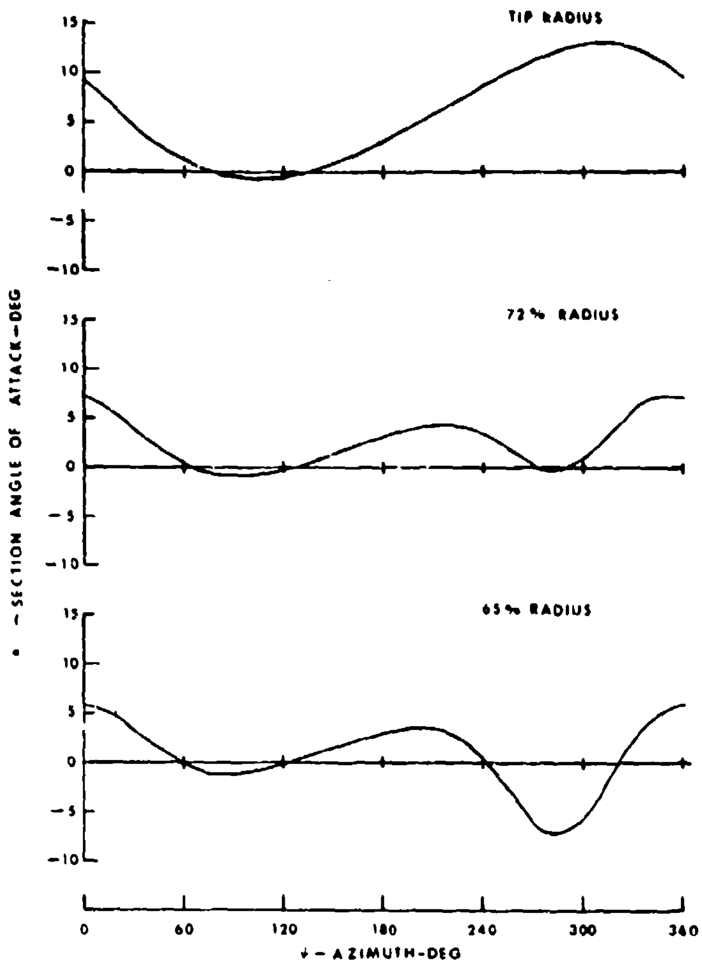

Figure 102. Angle-of-Attack Time Histories for the 6-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 550-A3.

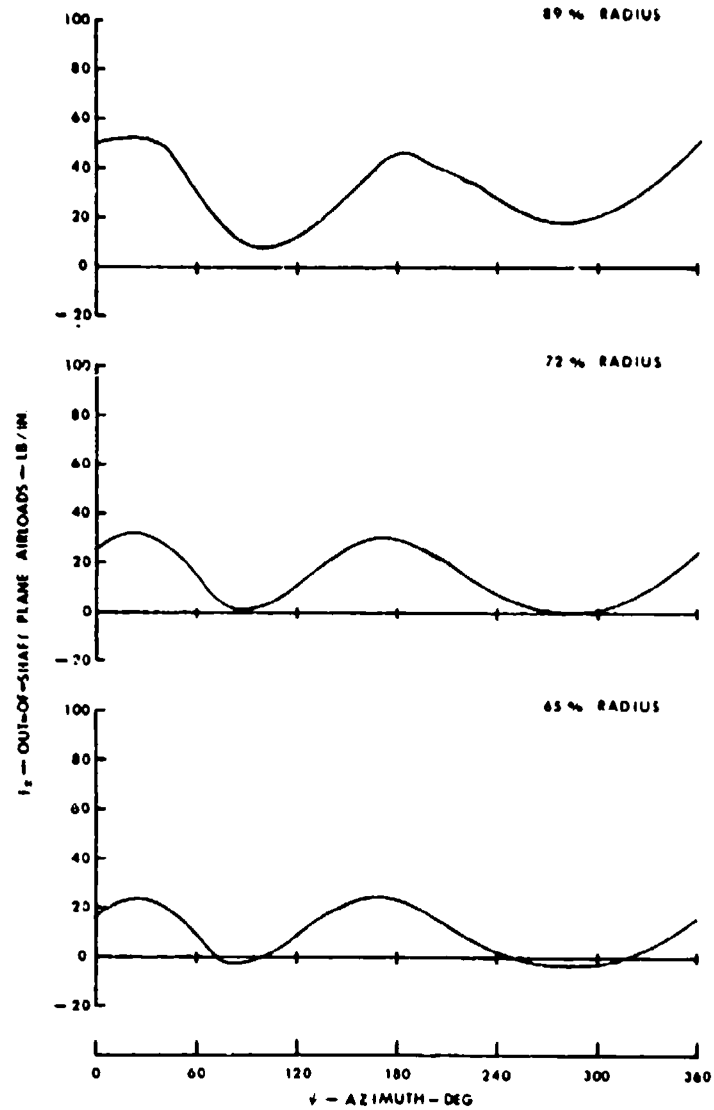

Figure 103. Out-of-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 550-A3.

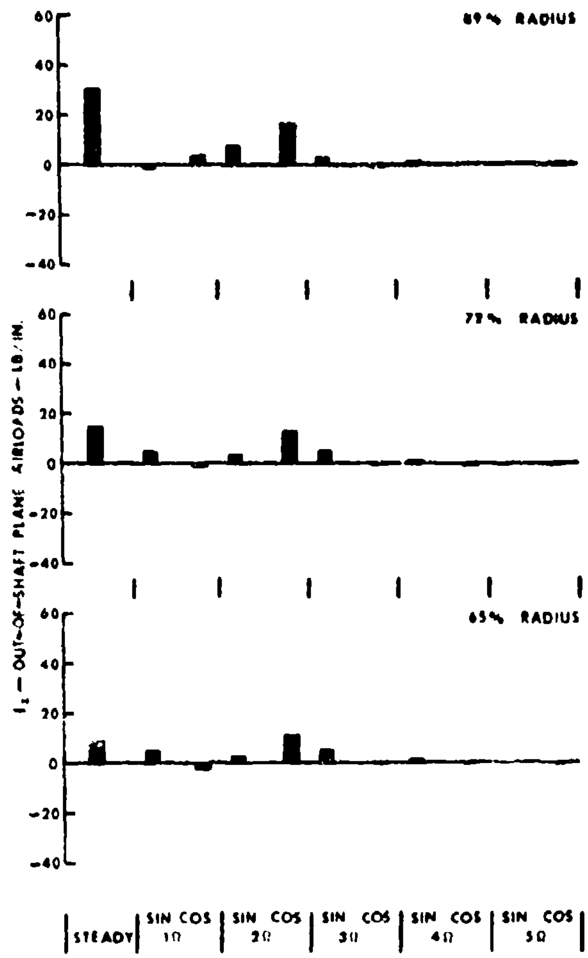

Figure 104. Out-of-Shaft Plane Airloads Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 180 Knots; η_z = 1.0; Case No. 550-A3.

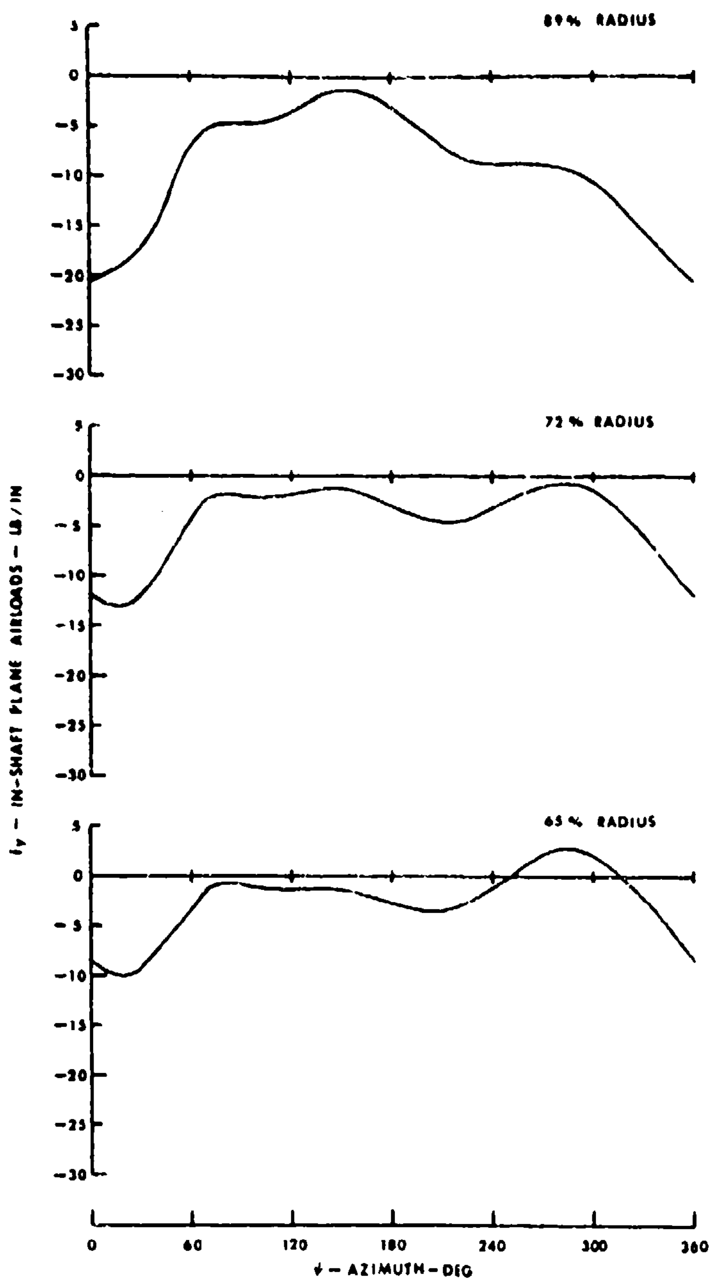

Figure 105. In-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 180 Knots; η_z = 1.0; Case No. 550-A3.

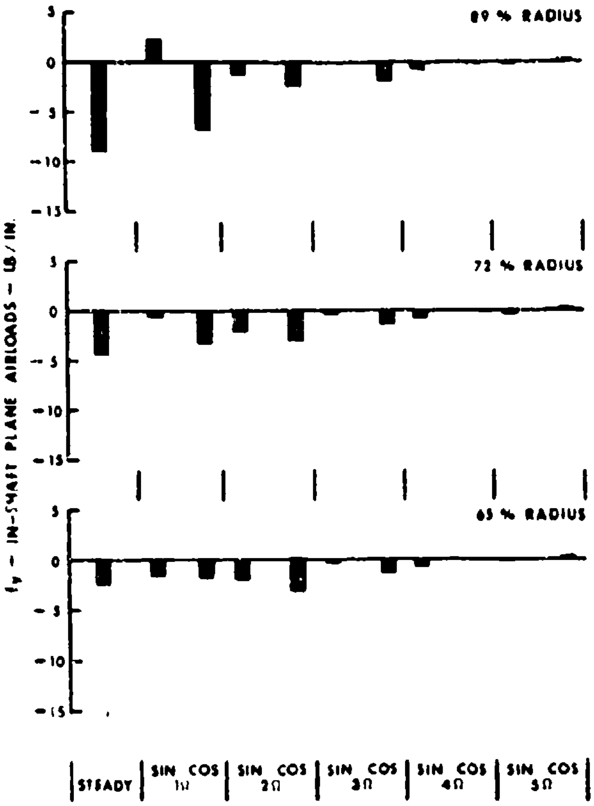

Figure 106. In-Shaft Plane Airload Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 550-A3.

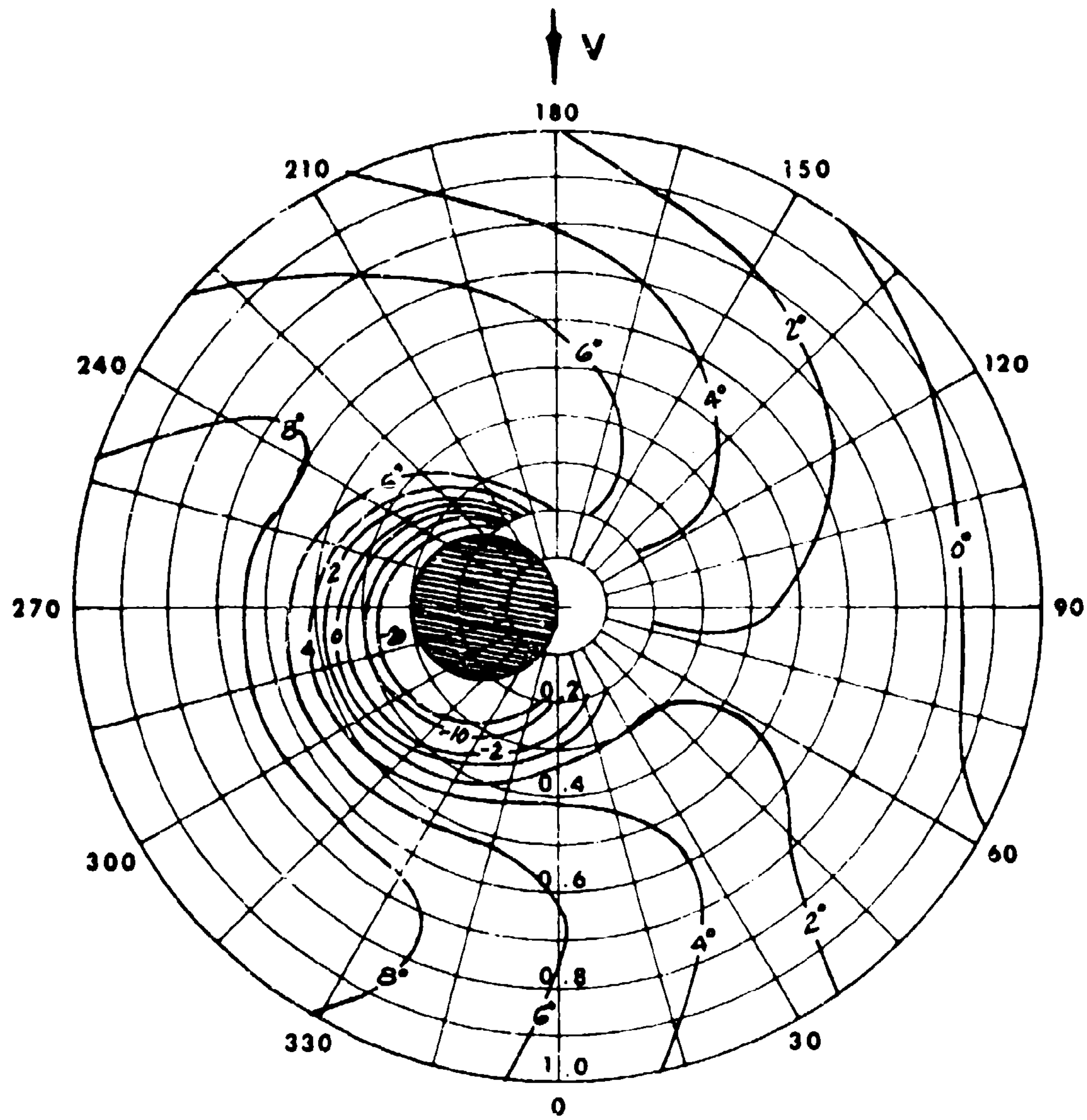

Figure 107. Angle-of-Attack Contours for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.8?; Case No. 655-A3.

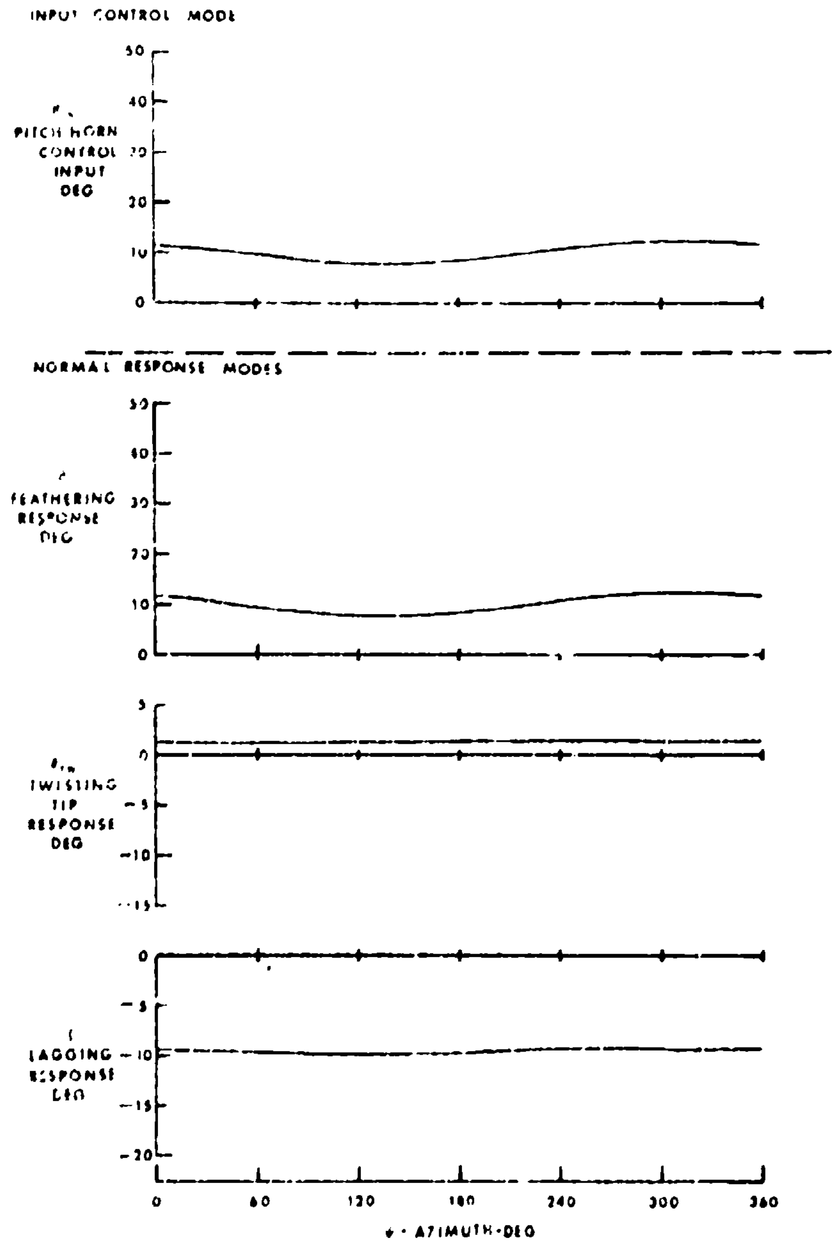

Figure 108. ...put Control Modes and Normal ...esponse Mode Time Histories for the 6-Bladed DCR.3 Configuration; V = 120 Knots; n_z = 1.83; Case No. 655-A3.

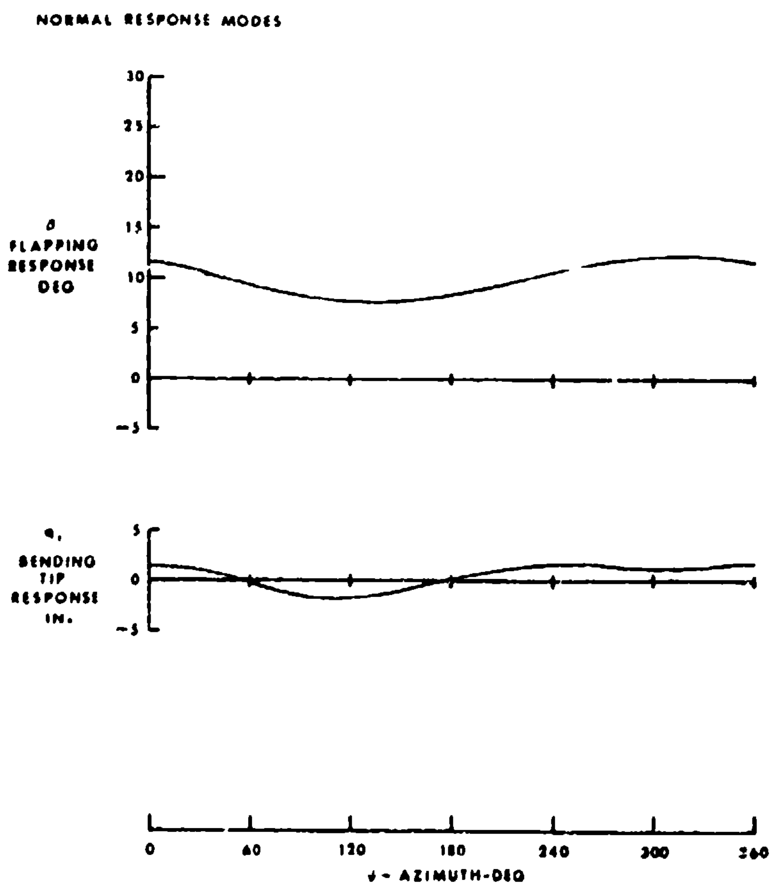

Figure 108 - Concluded

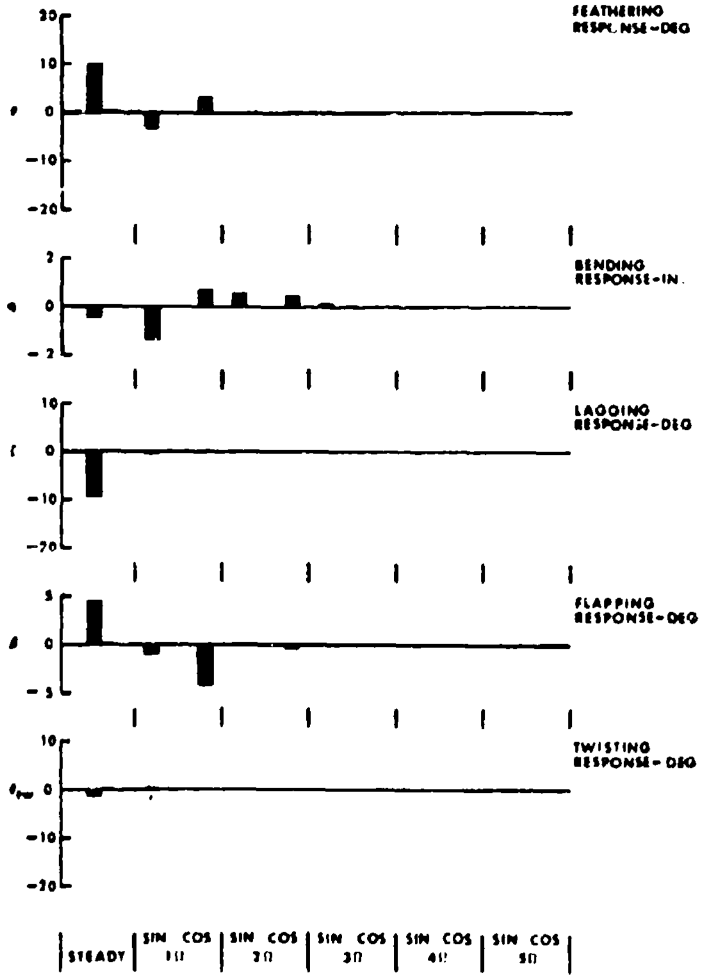

Figure 109. Normal Response Mode Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.83; Case No. 655-A3.

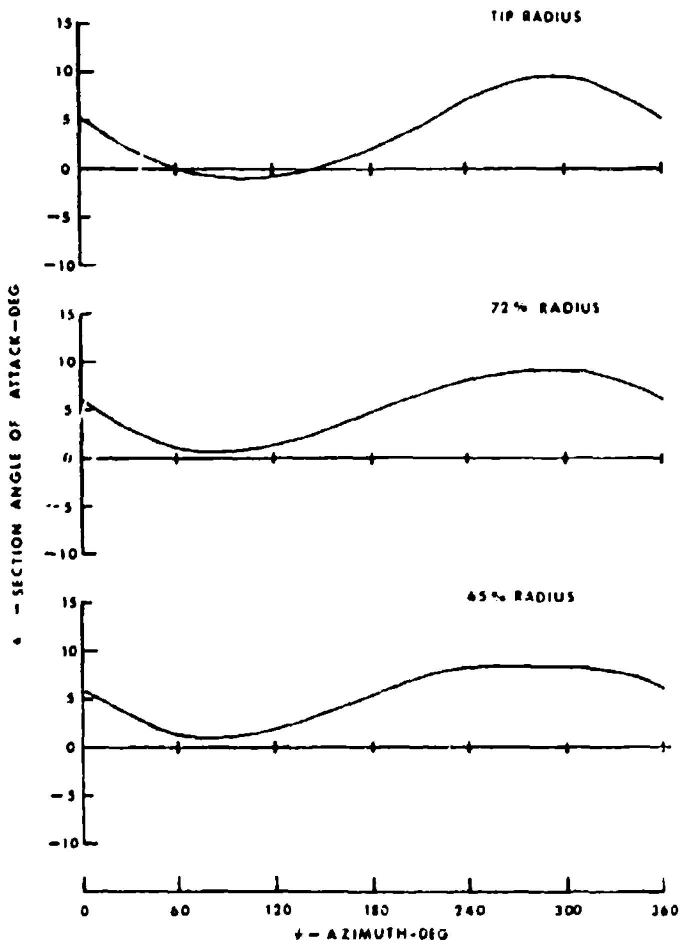

Figure 110. Angle-of-Attack Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; η_z = 1.83; Case No. 655-A3.

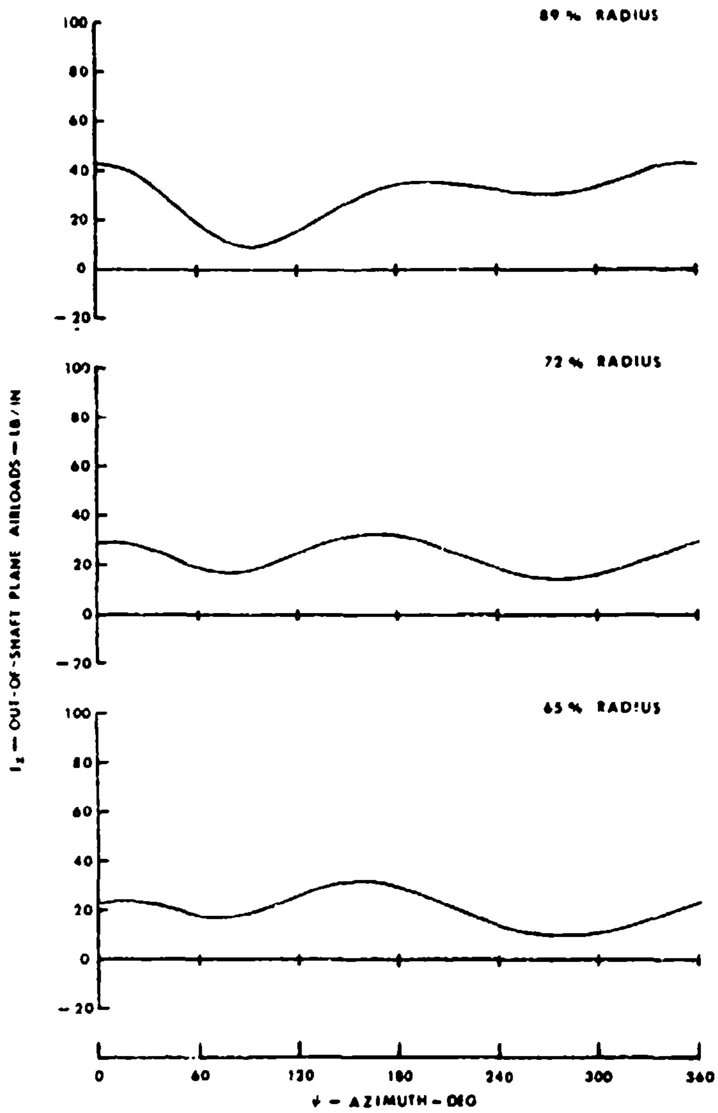

Figure 111. Out-of-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; η_z = 1.83; Case No. 655-A3.

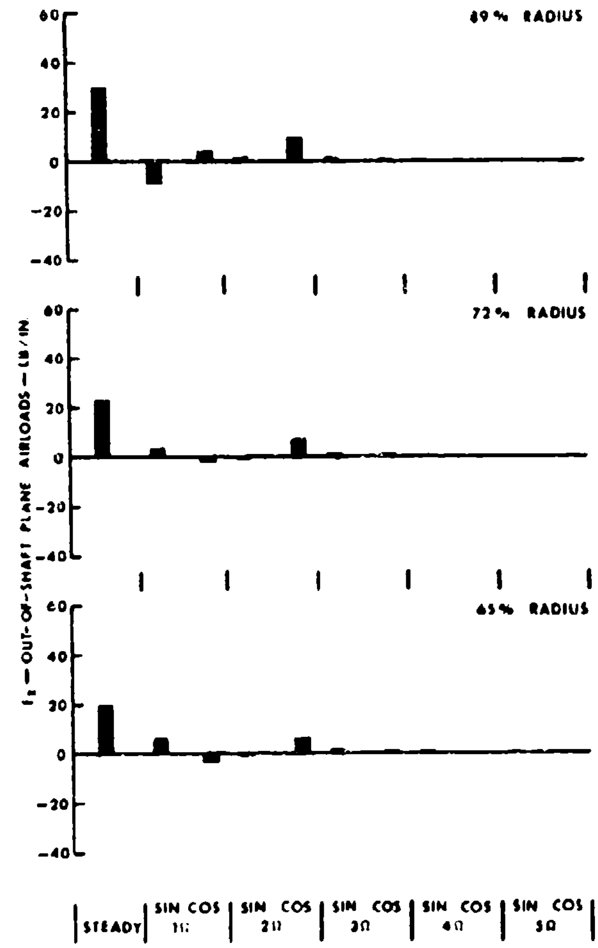

Figure 112. Out-of-Shaft Plane Airloads Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.83; Case No. 655-A3.

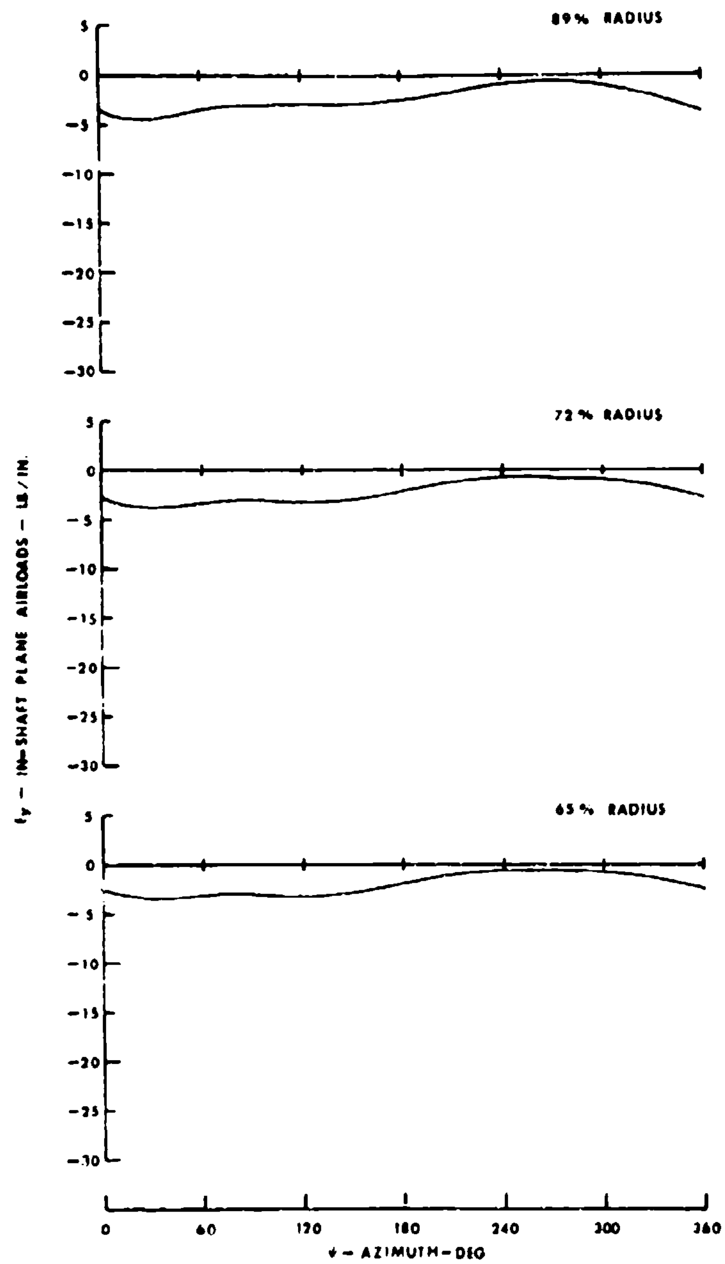

Figure 113. In-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 120 Knots; η_z = 1.83; Case No. 655-A3.

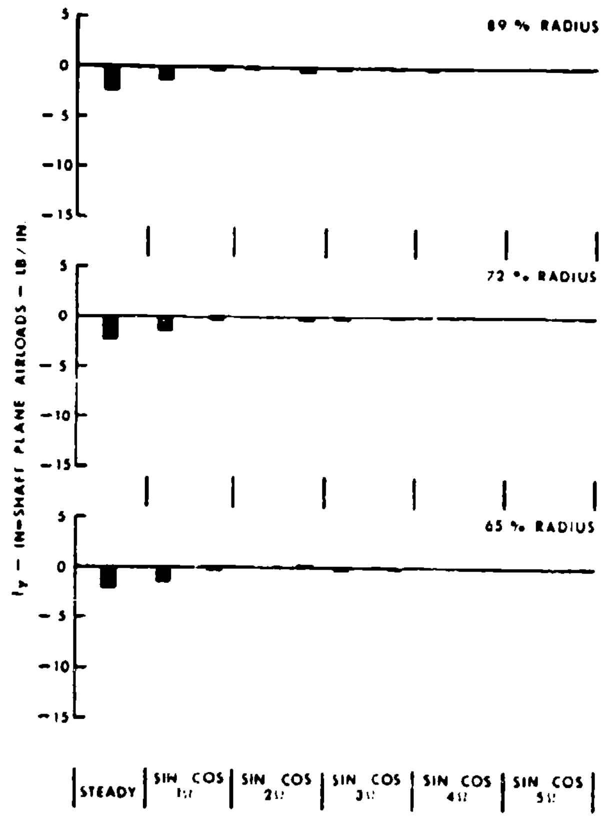

Figure 114. In-Shaft Plane Airload Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 120 Knots; n_z = 1.83; Case No. 655-A3.

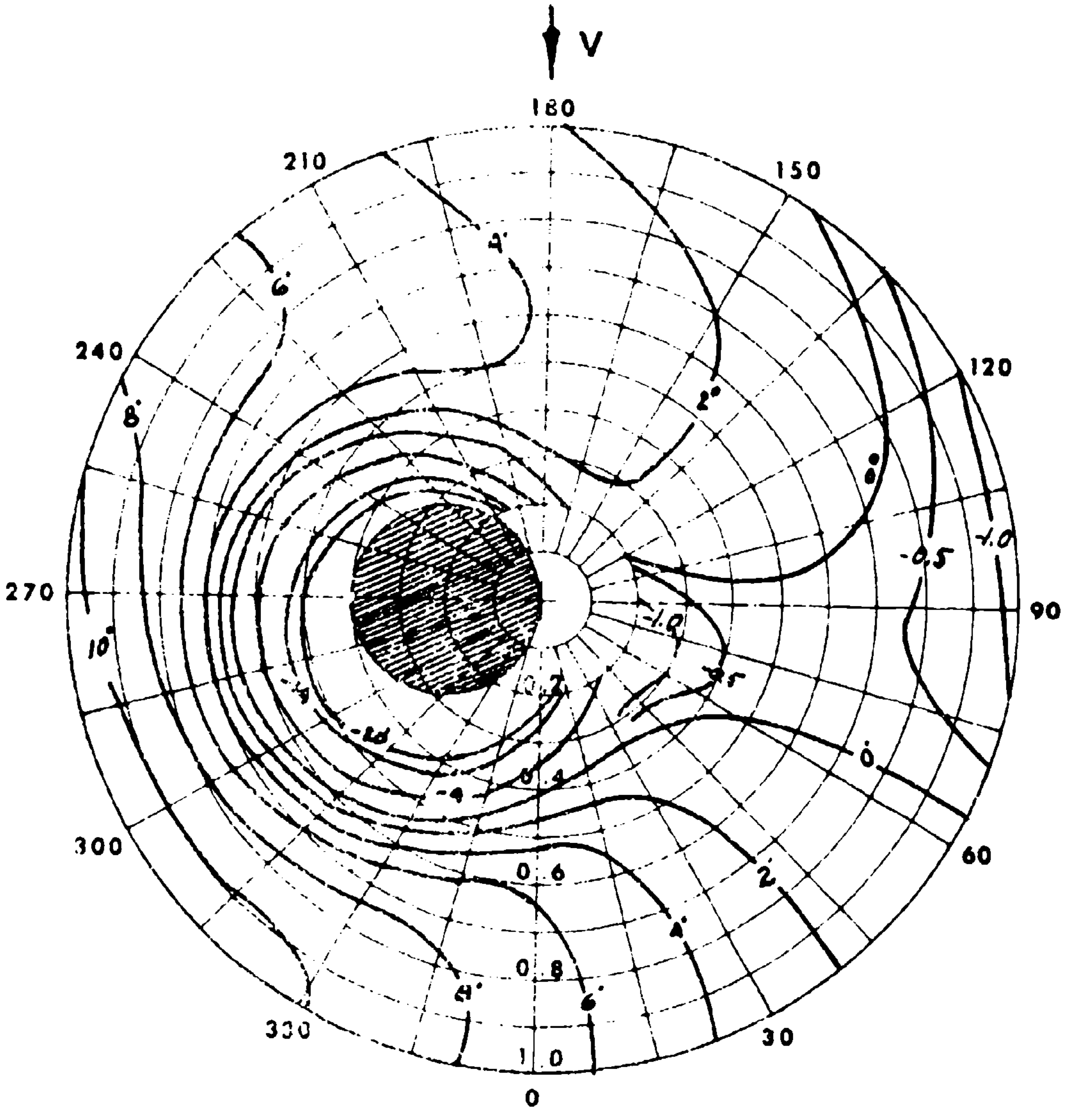

Figure 115. Angle-of-Attack Contours for the 6-Bladed DCRa3 Configuration; V = 160 Knots; μ_z = 1.35; Case No. 571-A1.

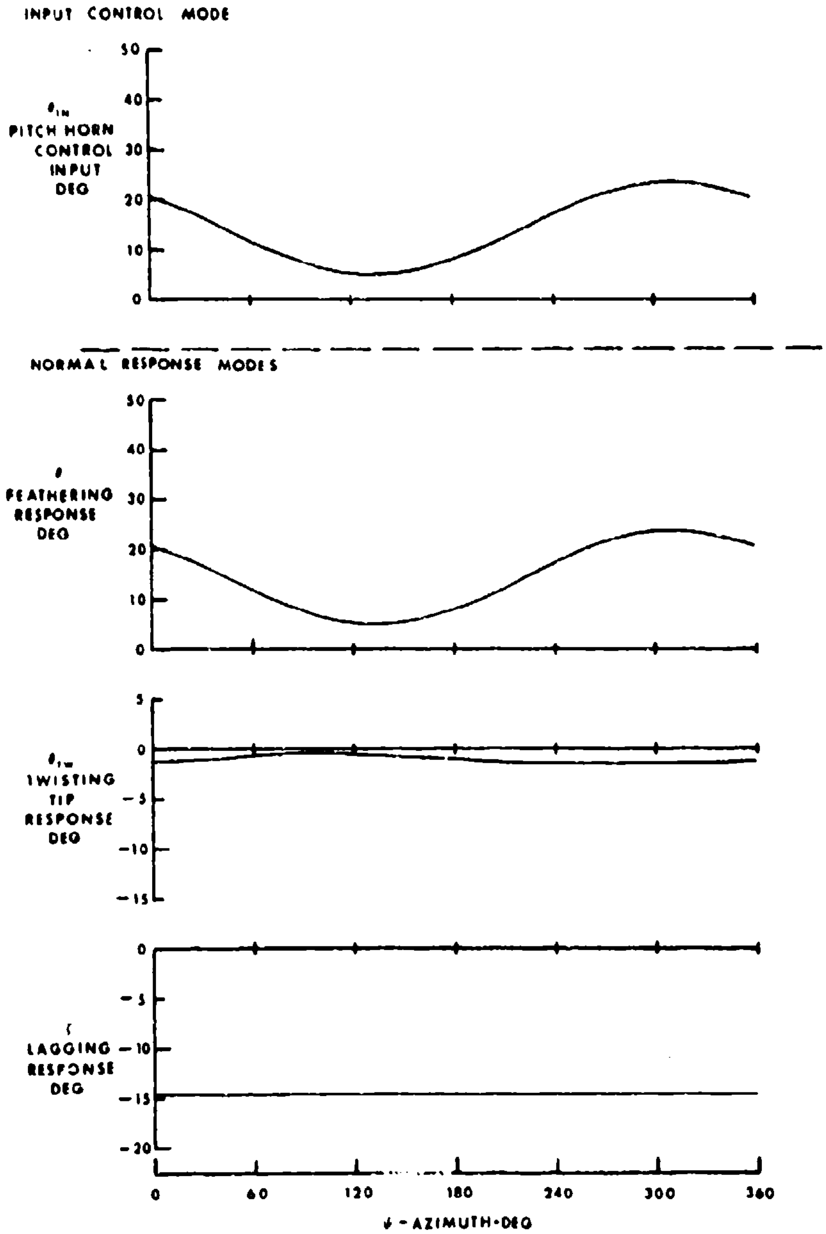

Figure 116. Input Control Modes and Normal Response Mode Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.35; Case No. 571-A1.

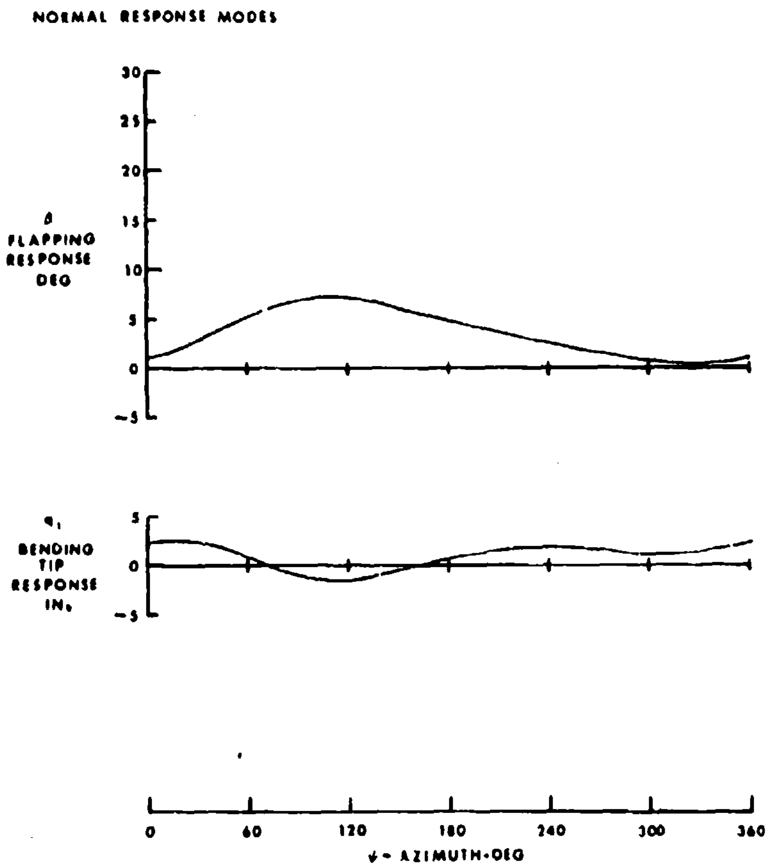

Figure 116 - Concluded

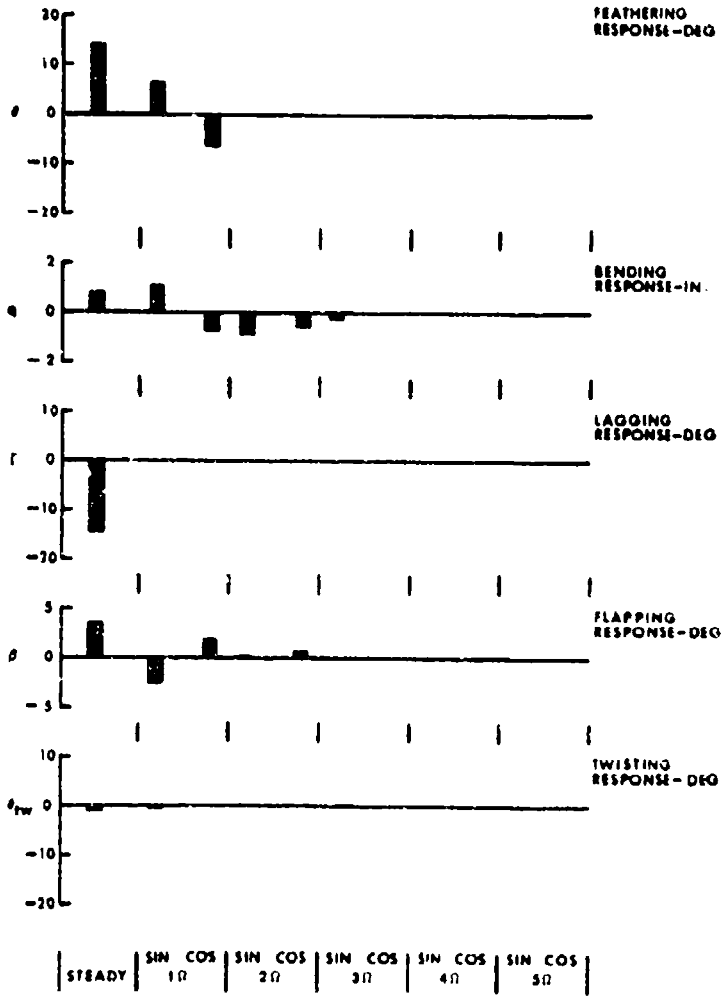

Figure 117. Normal Response Mode Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.35; Case No. 571-A1.

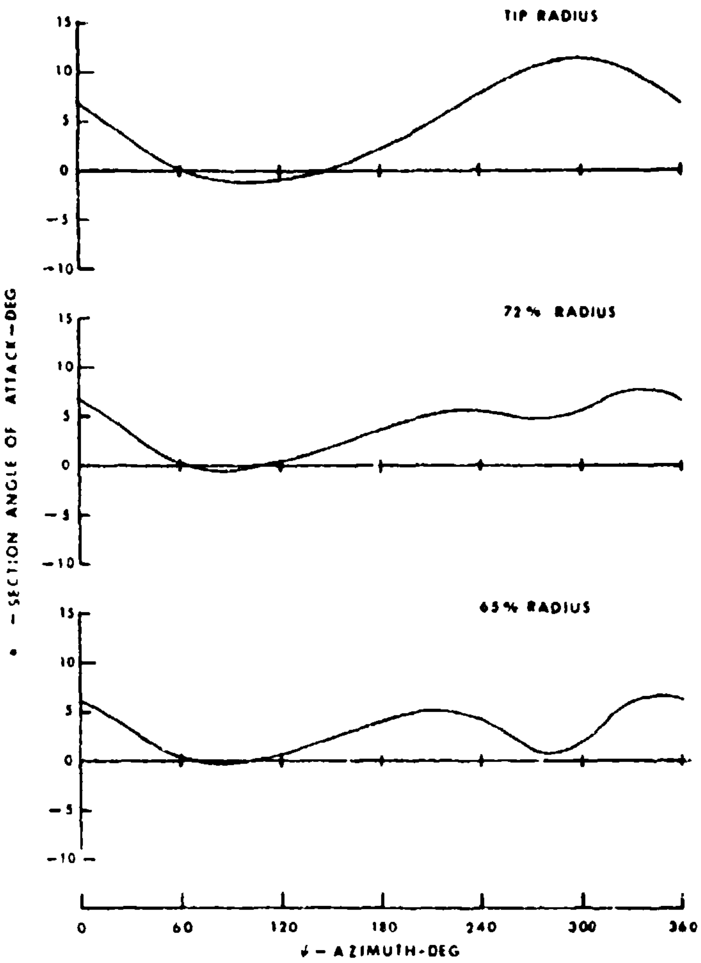

Figure 118. Angle-of-Attack Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.35; Case No. 571-A1.

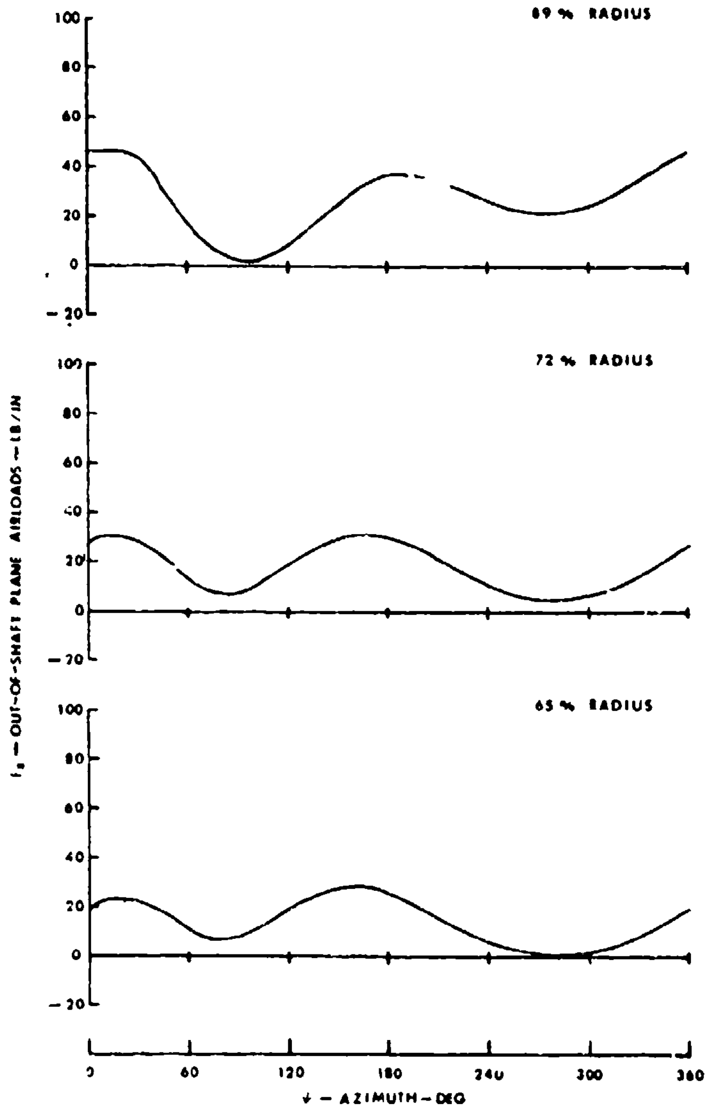

Figure 119. Out-of-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.35; Case No. 571-A1.

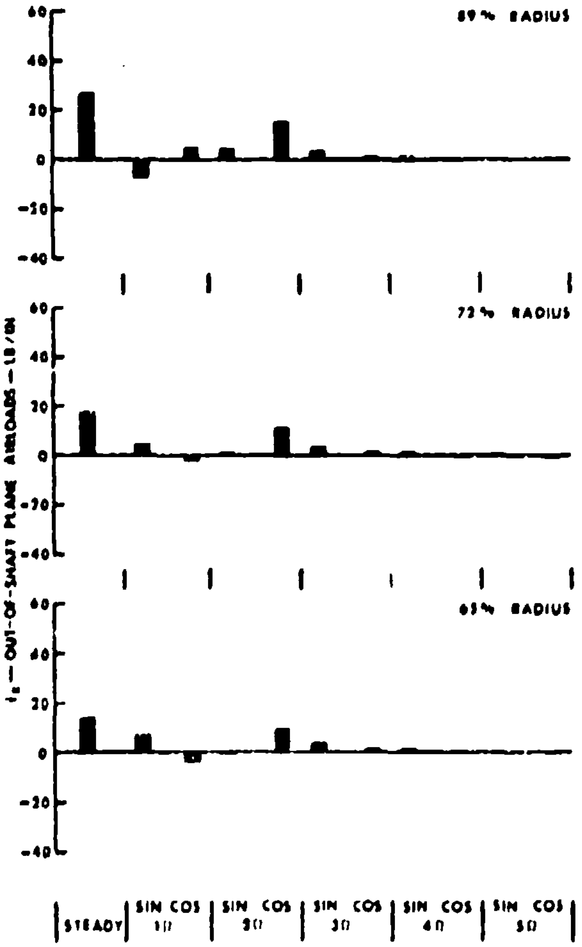

Figure 120. Out-of-Shaft Plane Airloads Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.35; Case No. 571-A1.

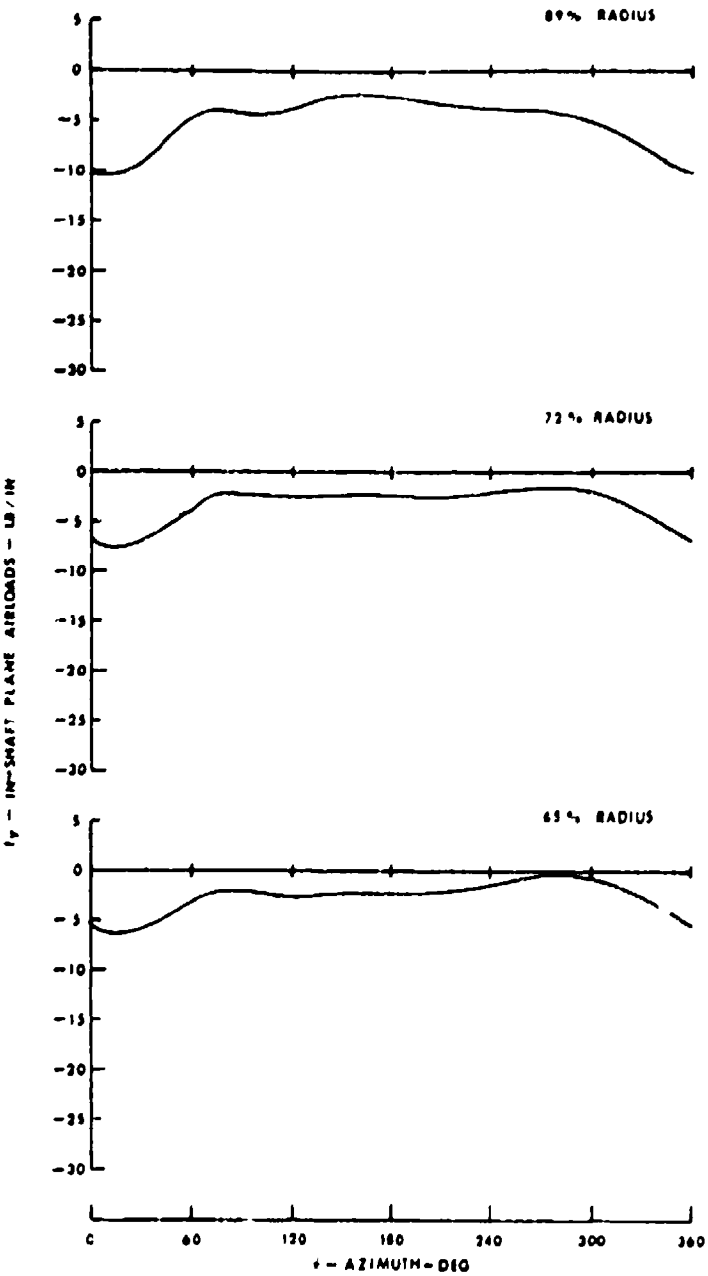

Figure 121. In-Shaft Plane Airload Time Histories for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.35; Case No. 571-A1.

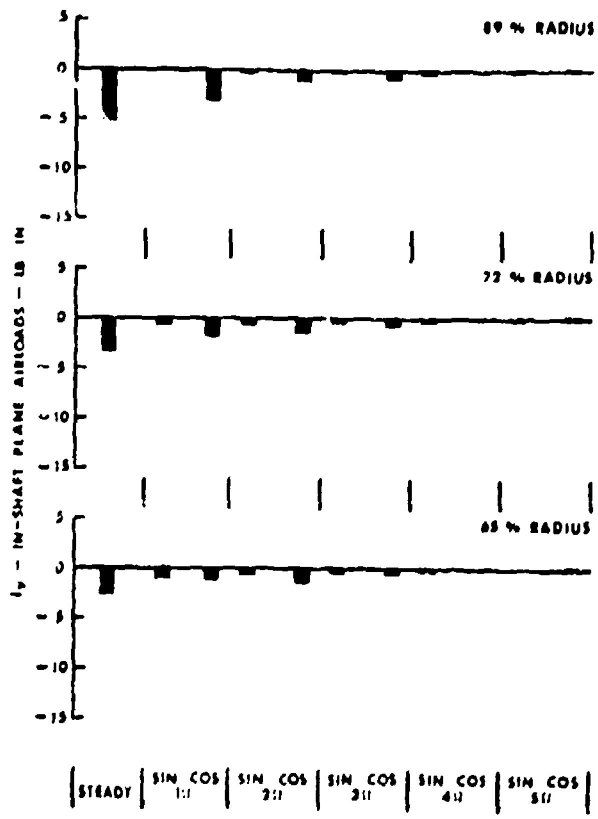

Figure 122. In-Shaft Plane Airload Harmonic Analysis for the 6-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.35; Case No. 571-A1.

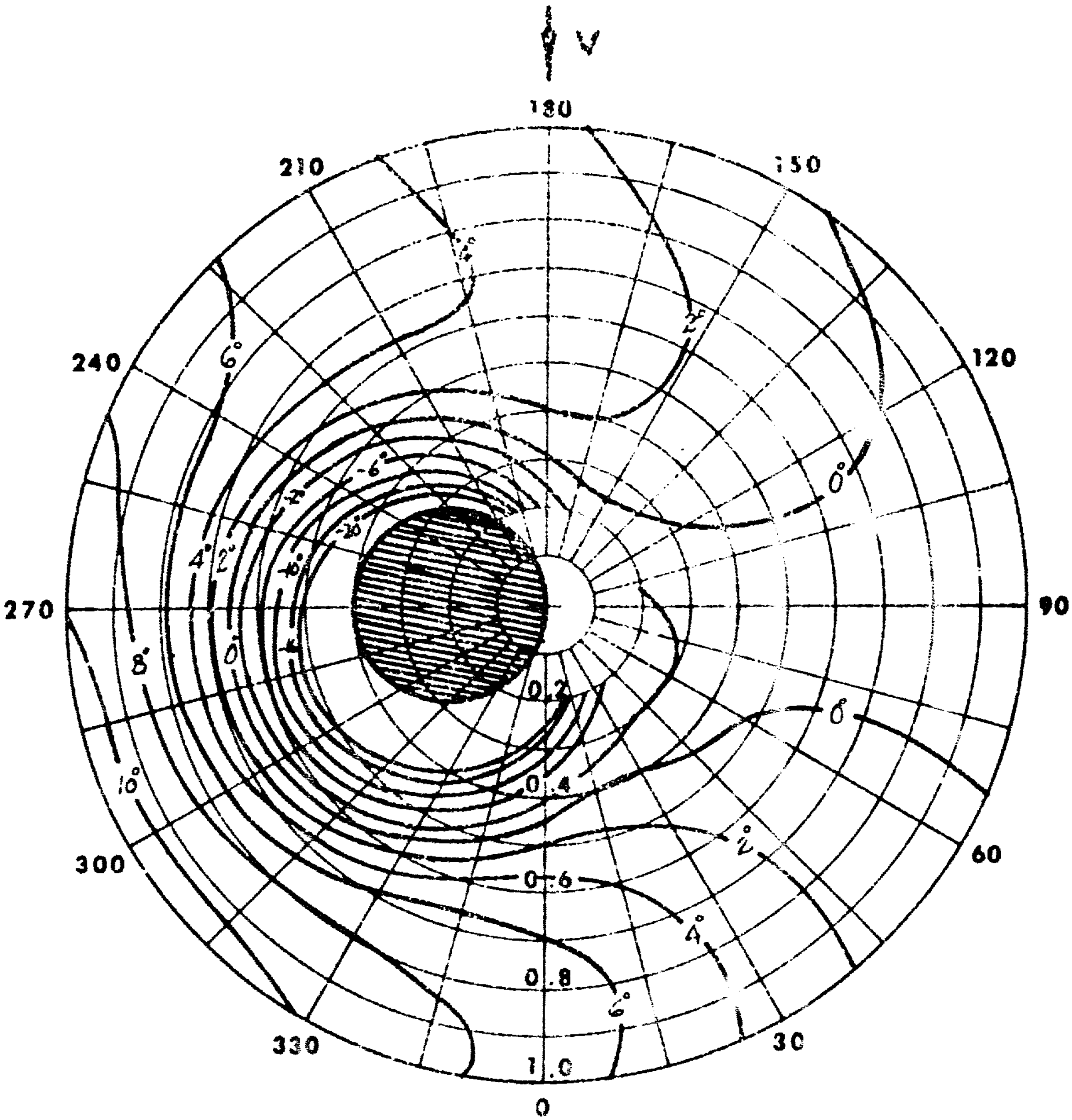

Figure 123. Angle-of-Attack Contours for the 5-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 654-1.

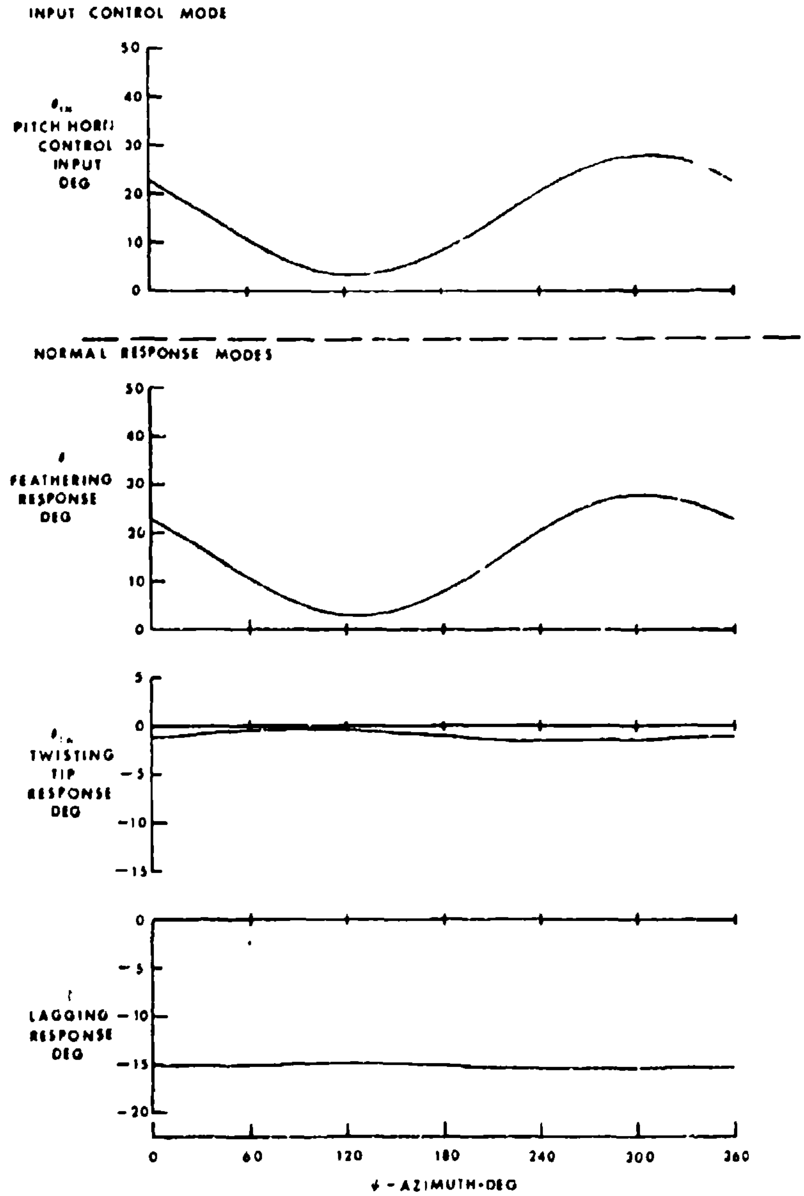

Figure 124. Input Control Modes and Normal Response Mode Time Histories for the 5-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 654-1.

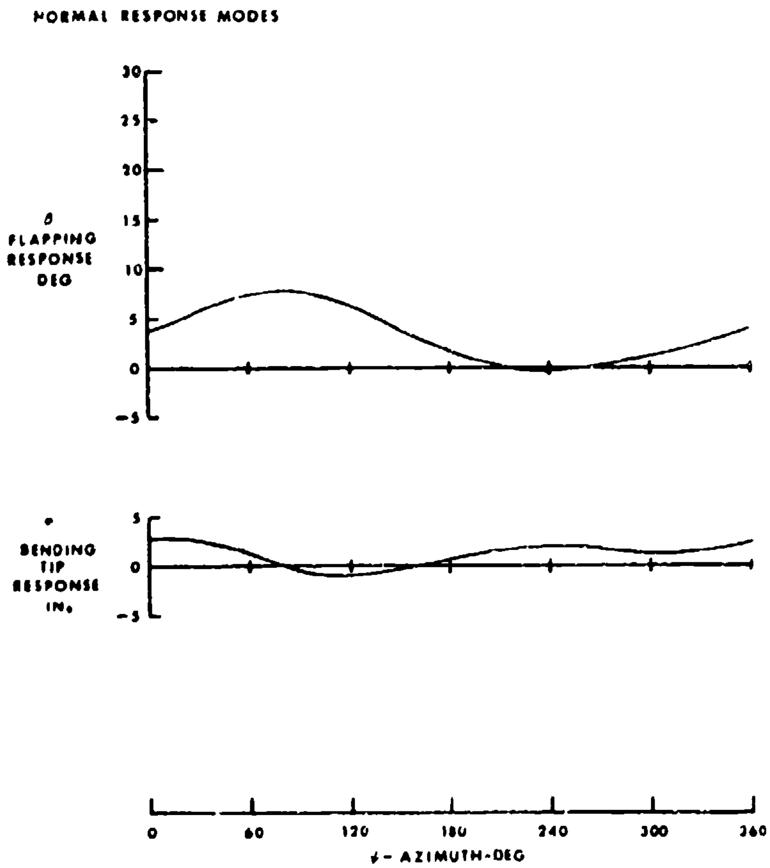

Figure 124 - Concluded

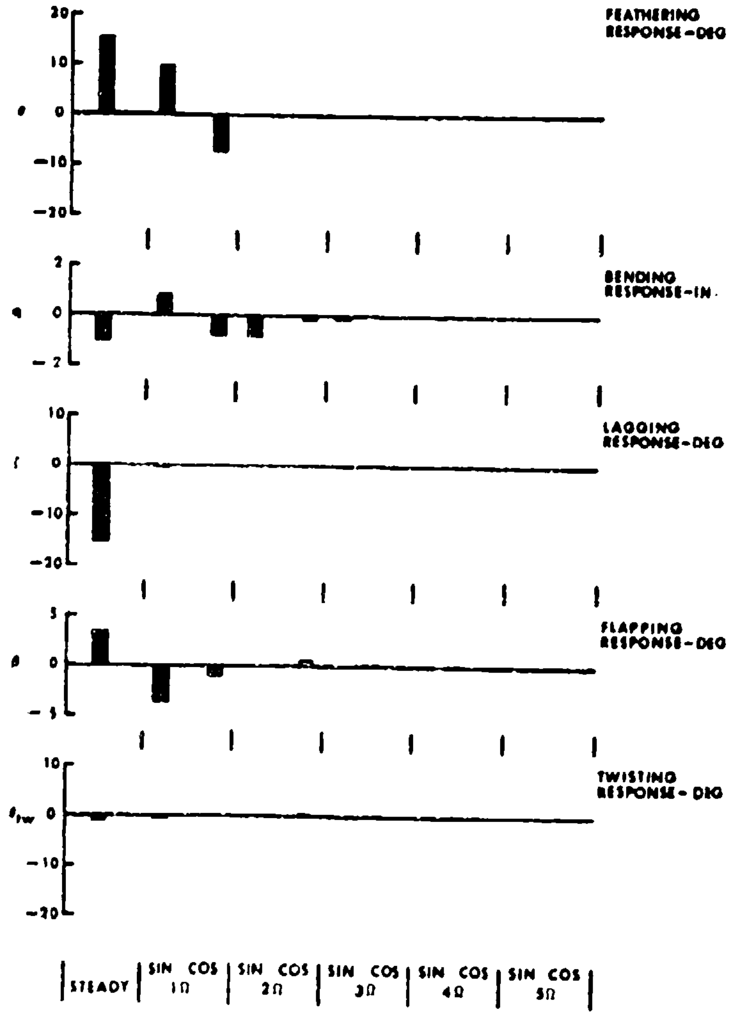

Figure 125. Normal Response Mode Harmonic Analysis for the 5-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.0; Case No. 654-1.

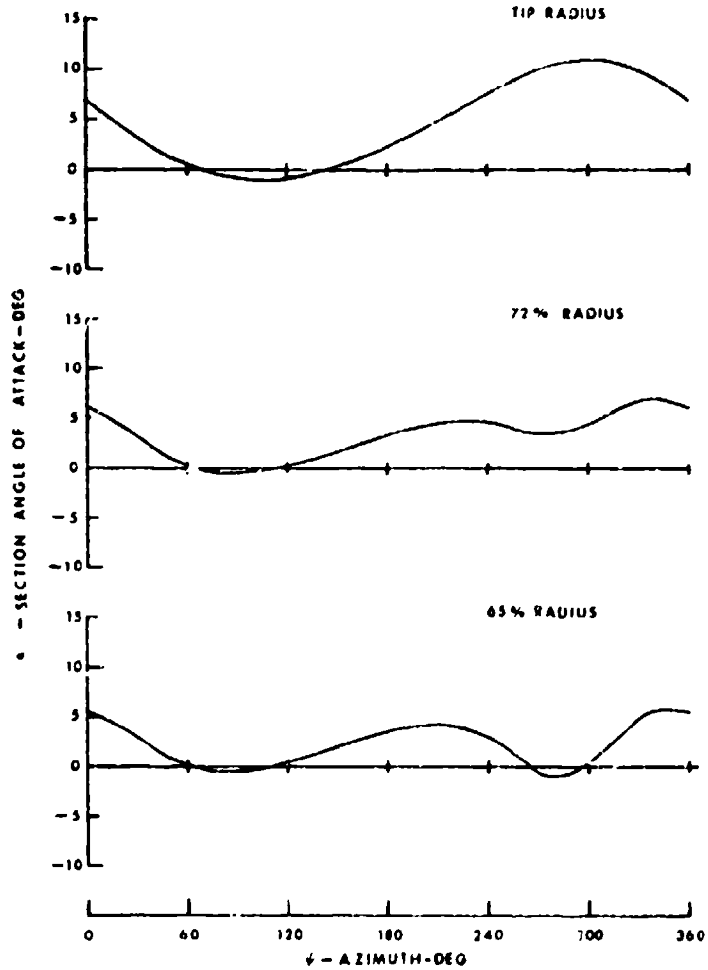

Figure 126. Angle-of-Attack Time Histories for the 5-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 654-1.

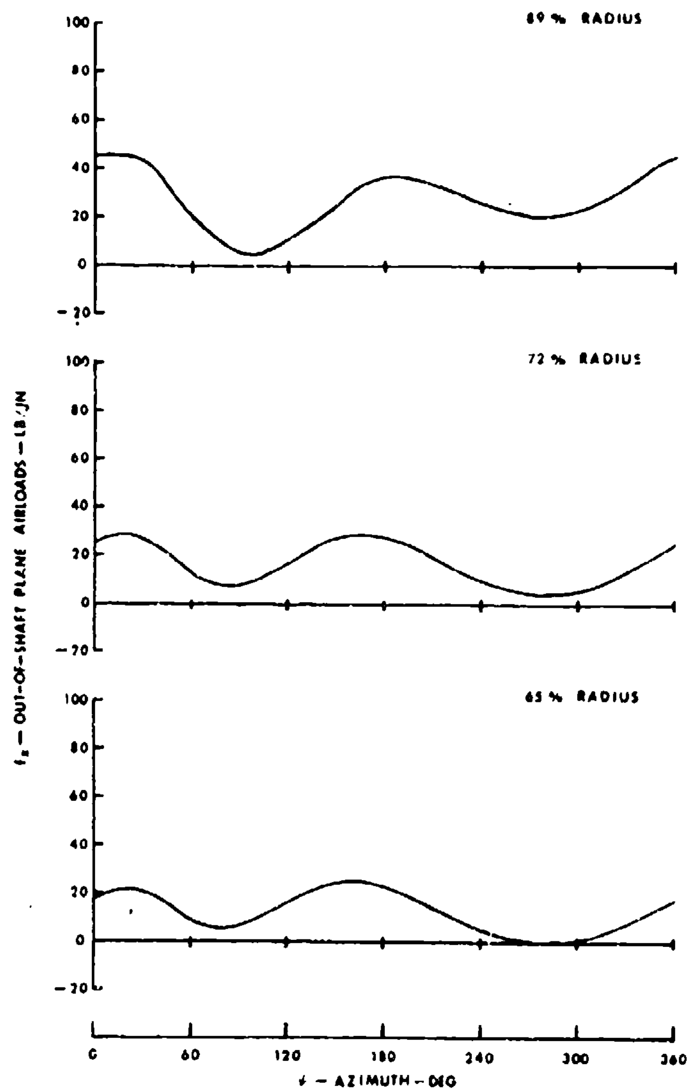

Figure 127. Out-of-Shaft Plane Airload Time Histories for the 5-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.0; Case No. 654-1.

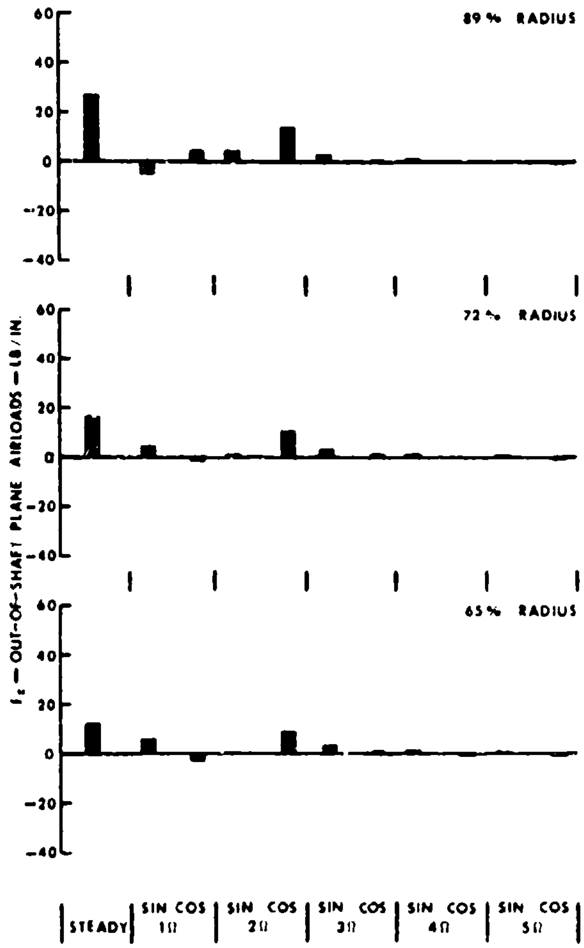

Figure 128. Out-of-Shaft Plane Airloads Harmonic Analysis for the 5-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 654-1.

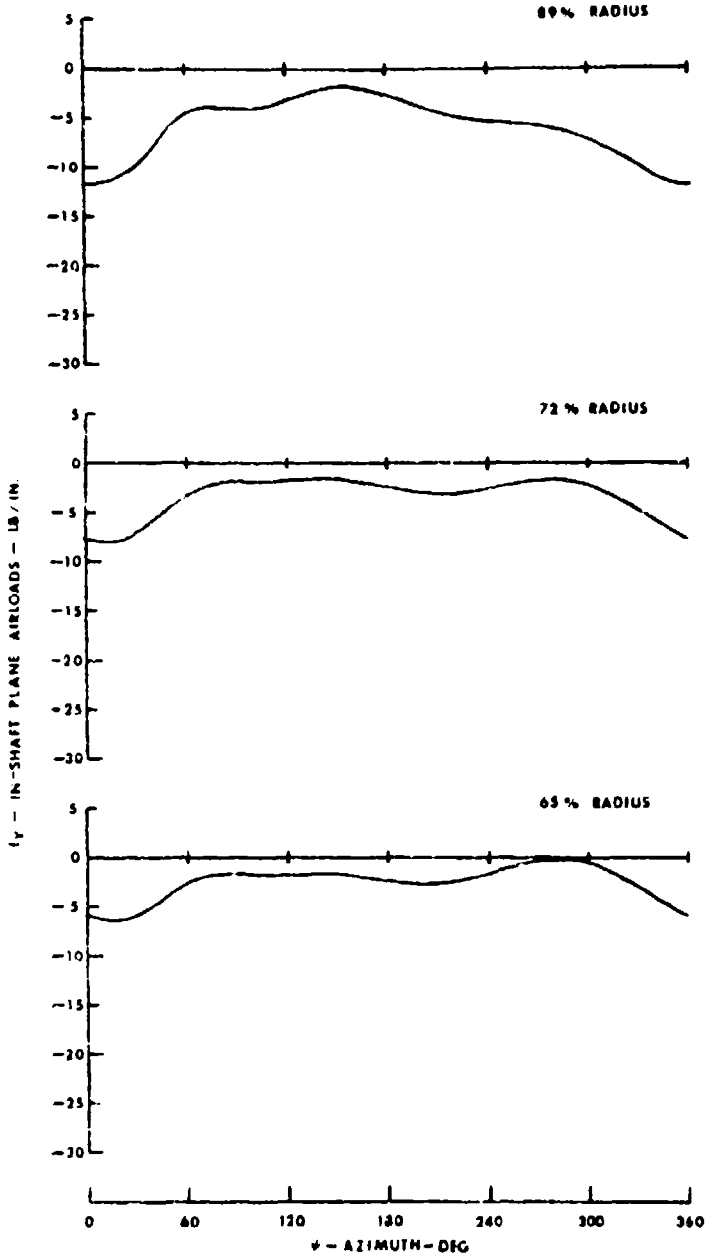

Figure 129. In-Shaft Plane Airload Time Histories for the 5-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 654-1.

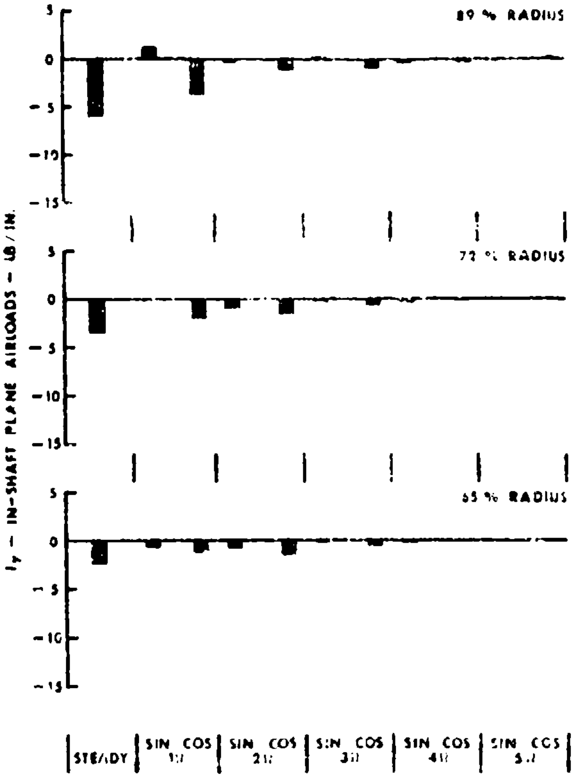

Figure 130. In-Shaft Plane Airload Harmonic Analysis for the 5-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 654-1.

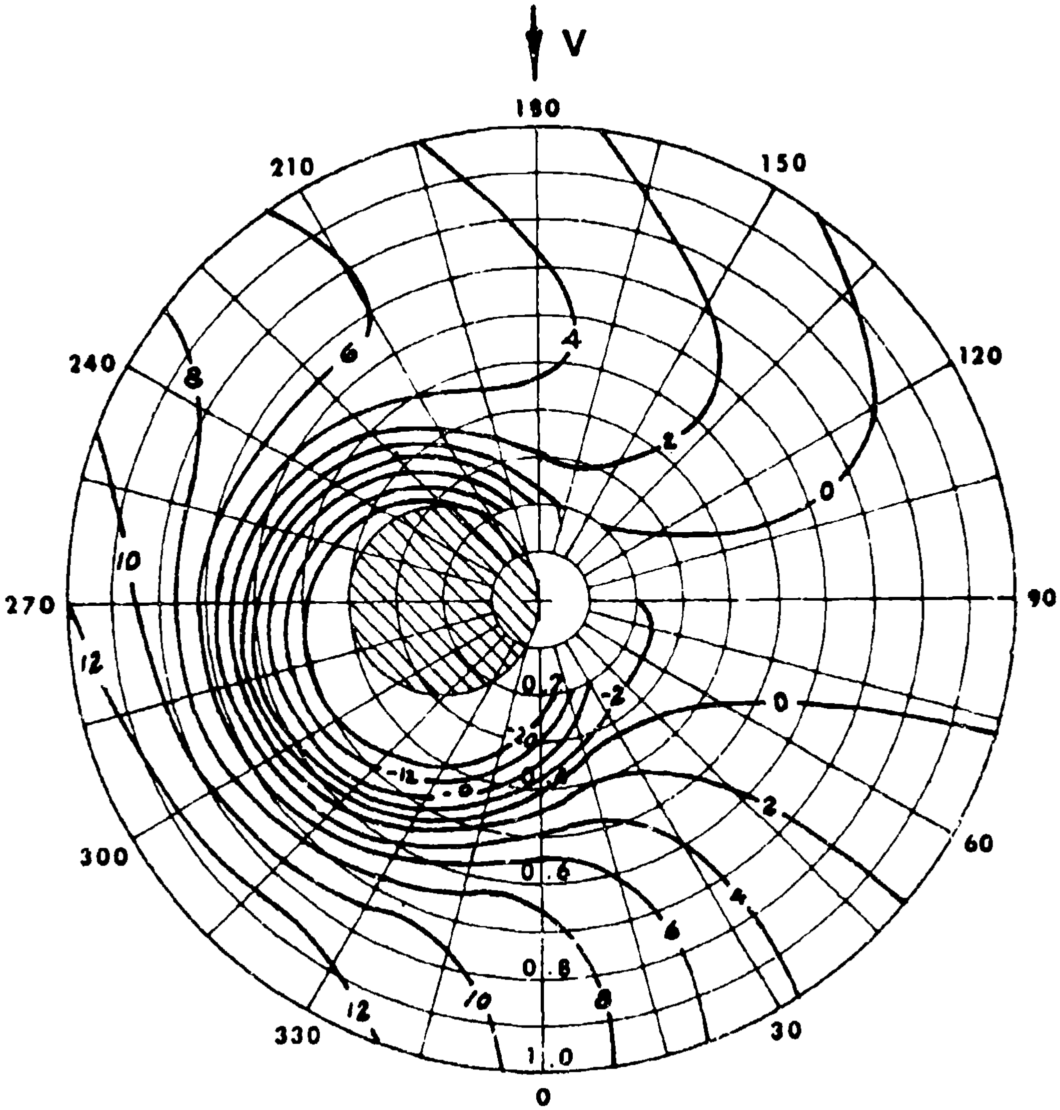

Figure 131. Angle-of-Attack Contours for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

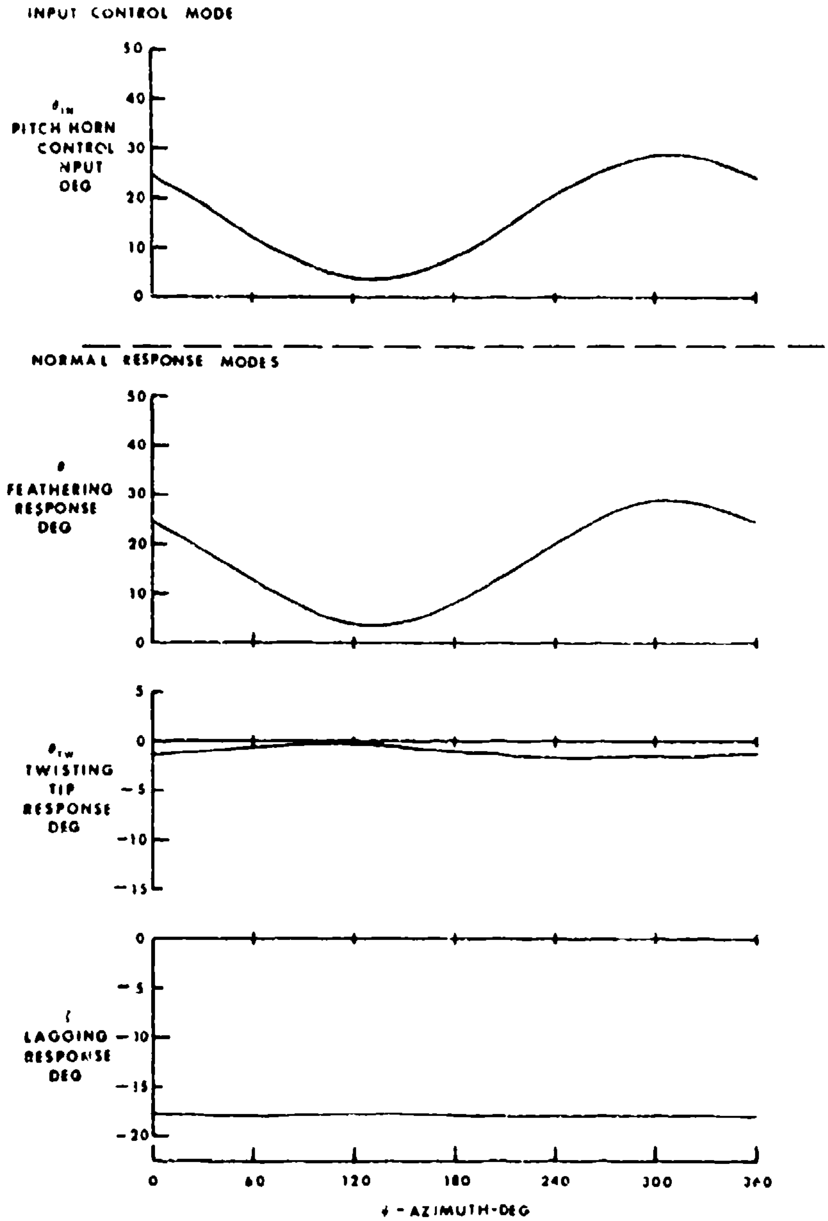

Figure 132. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

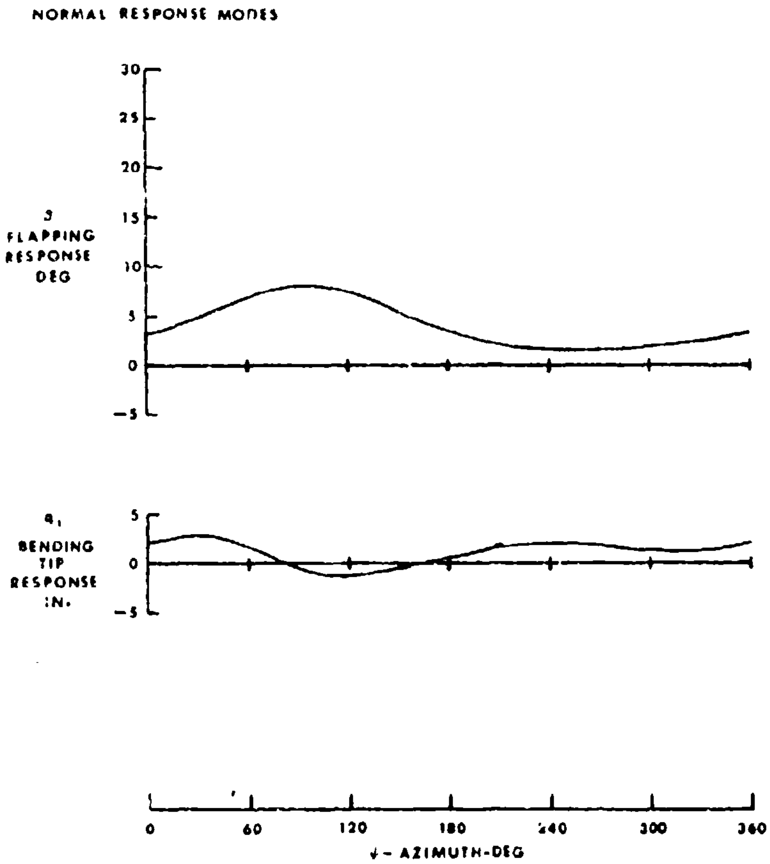

Figure 132 - Concluded

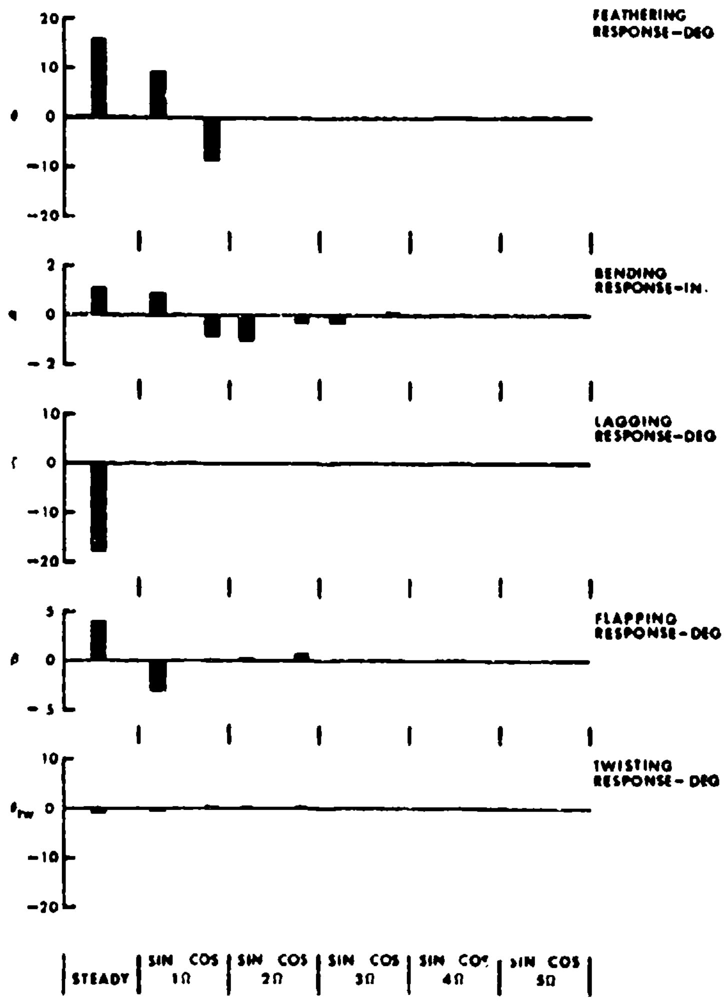

Figure 133. Normal Response Mode Harmonic Analysis for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

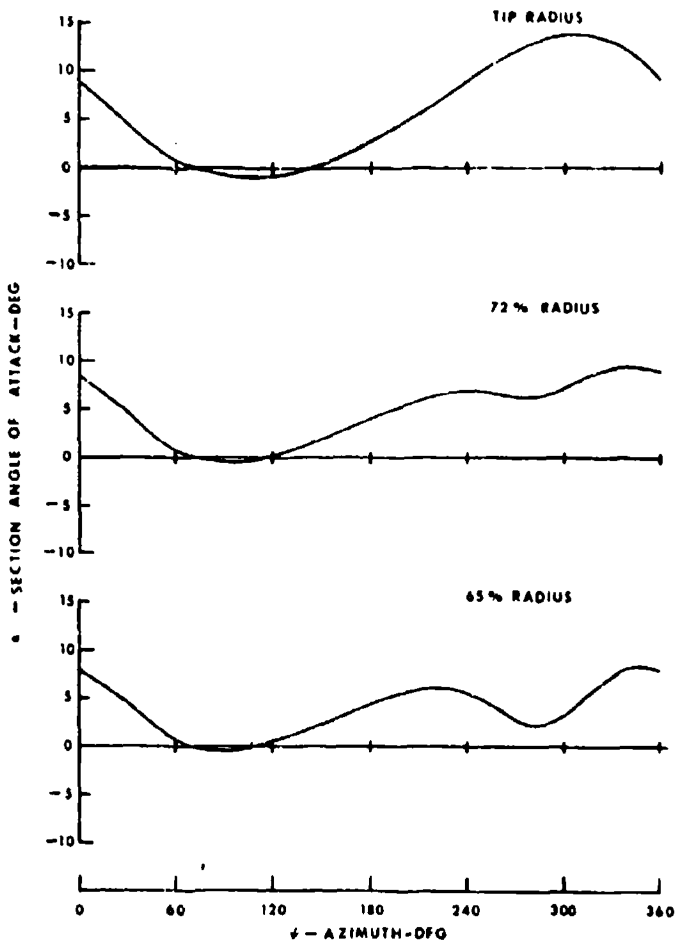

Figure 134. Angle-of-Attack Time Histories for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

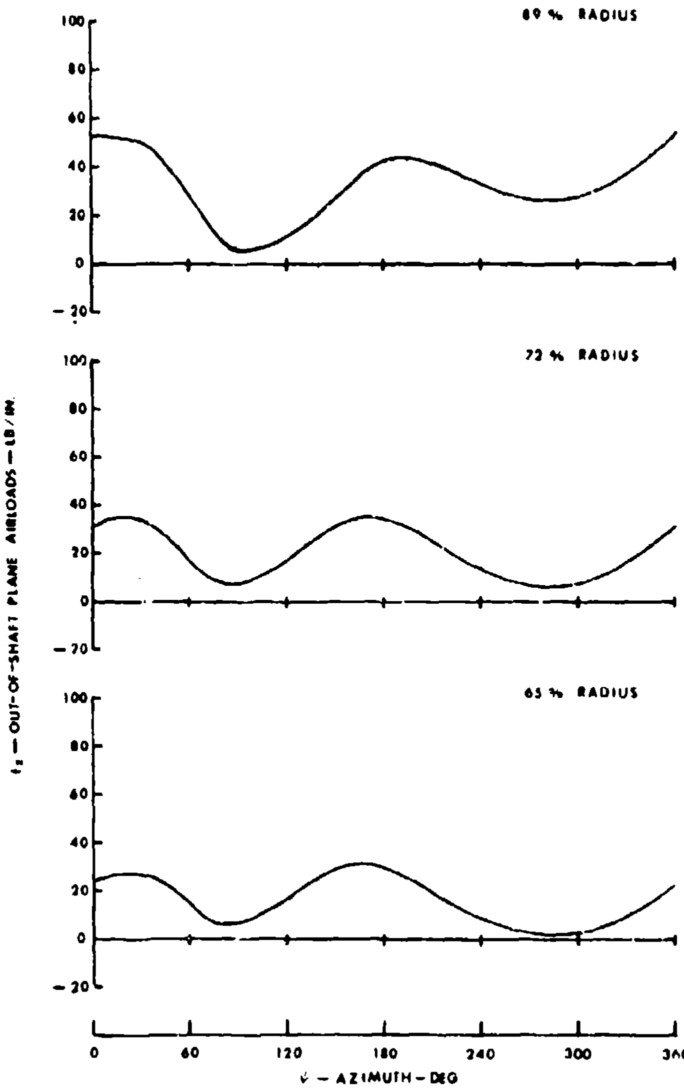

Figure 135. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

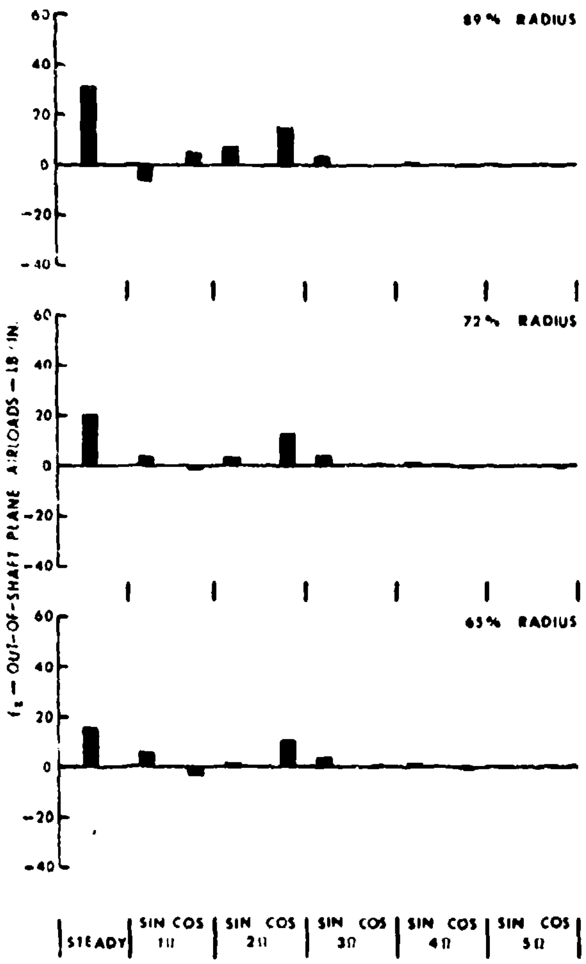

Figure 136. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

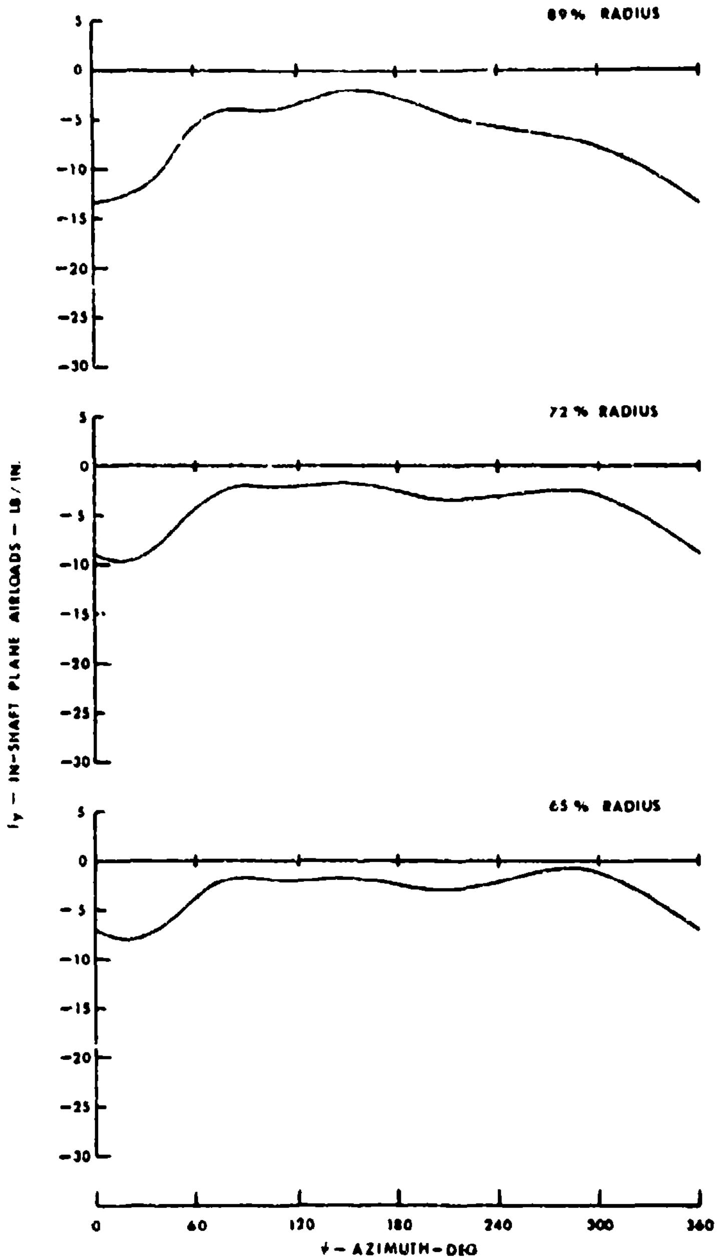

Figure 137. In-Shaft Plane Airload Time Histories for the 4-Bladed DCRa3 Configuration; V = 160 Knots; n_z = 1.0; Case No. 104-10.

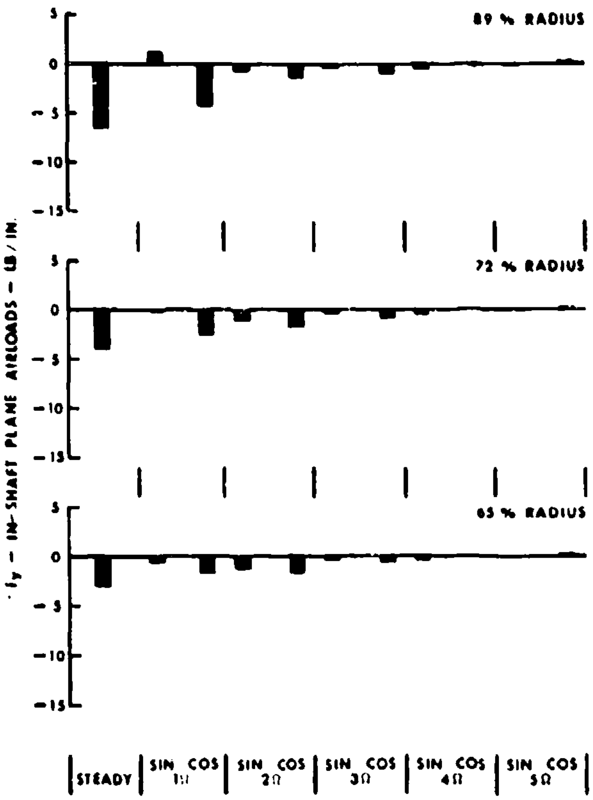

Figure 138. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed DCRa3 Configuration; V = 160 Knots; η_z = 1.0; Case No. 104-10.

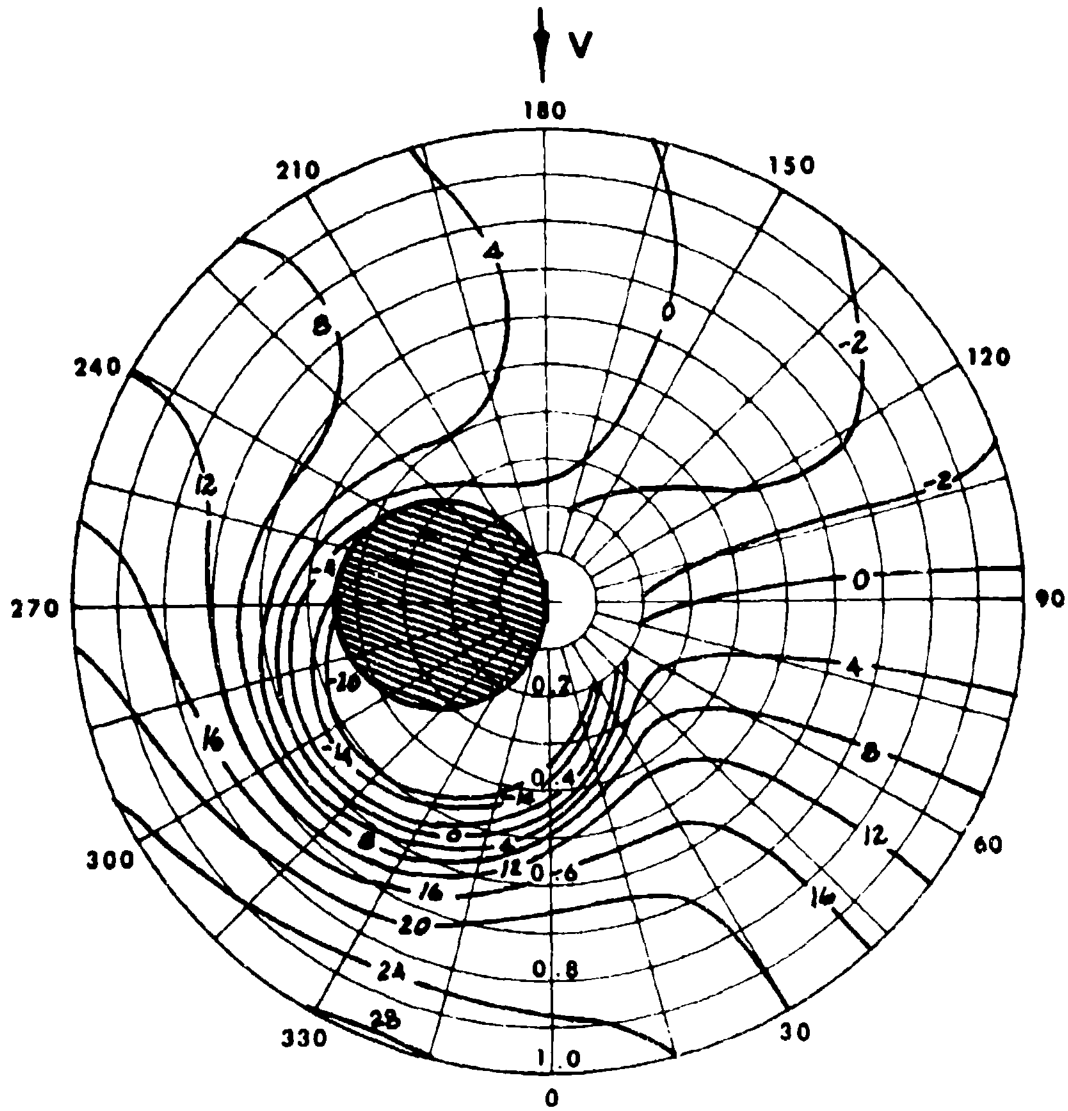

Figure 139. Angle-of-Attack Contours for the 4-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 845-9.

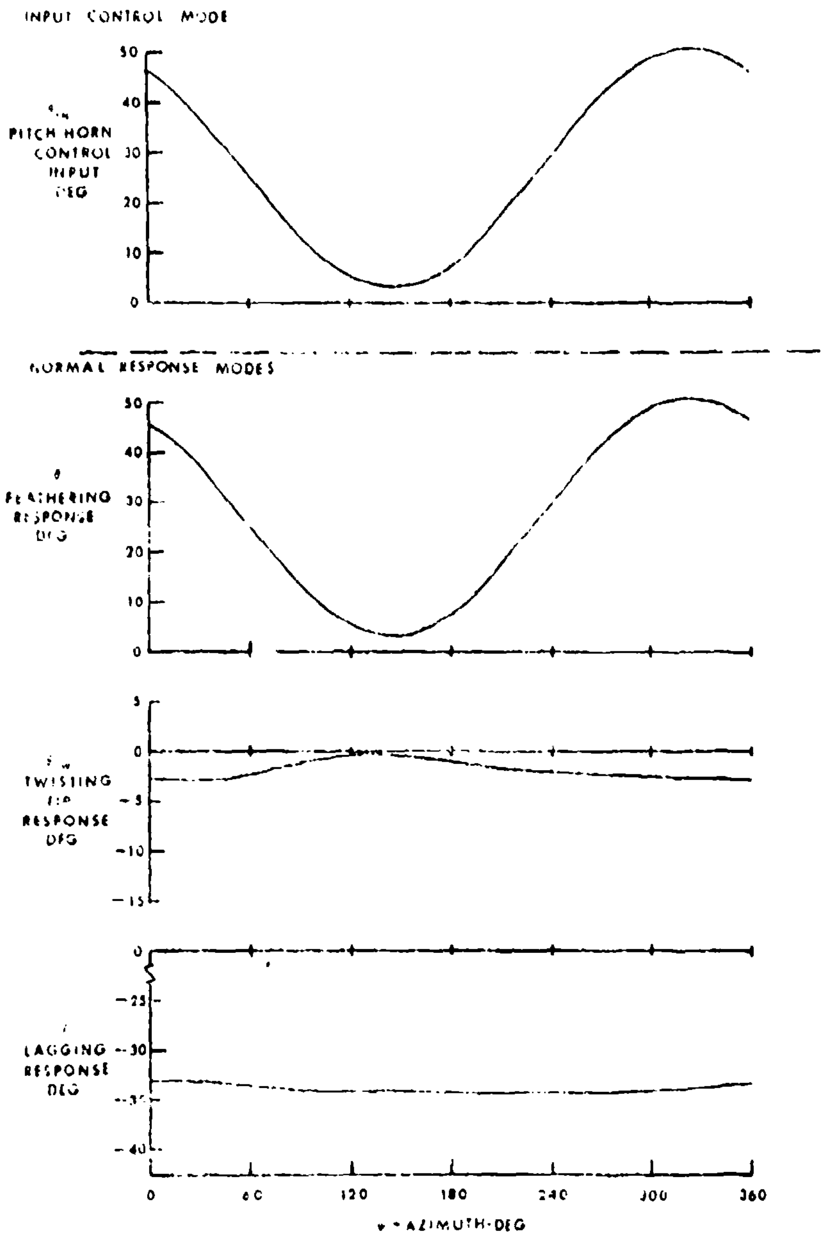

Figure 140. Input Control Modes and Normal Response Mode Time Histories for the 4-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 845-9.

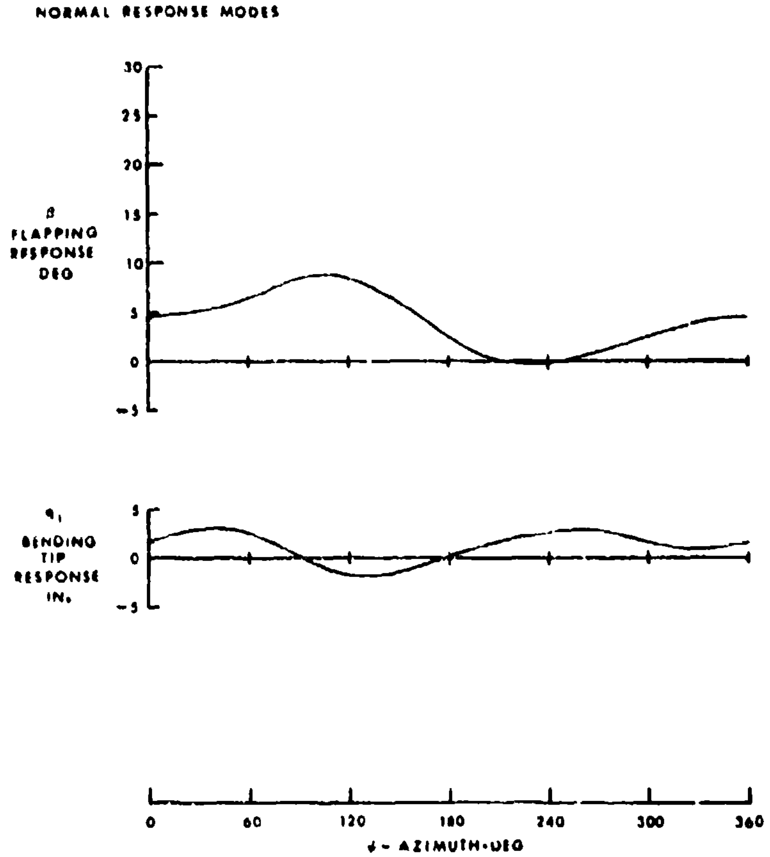

Figure 140 - Concluded

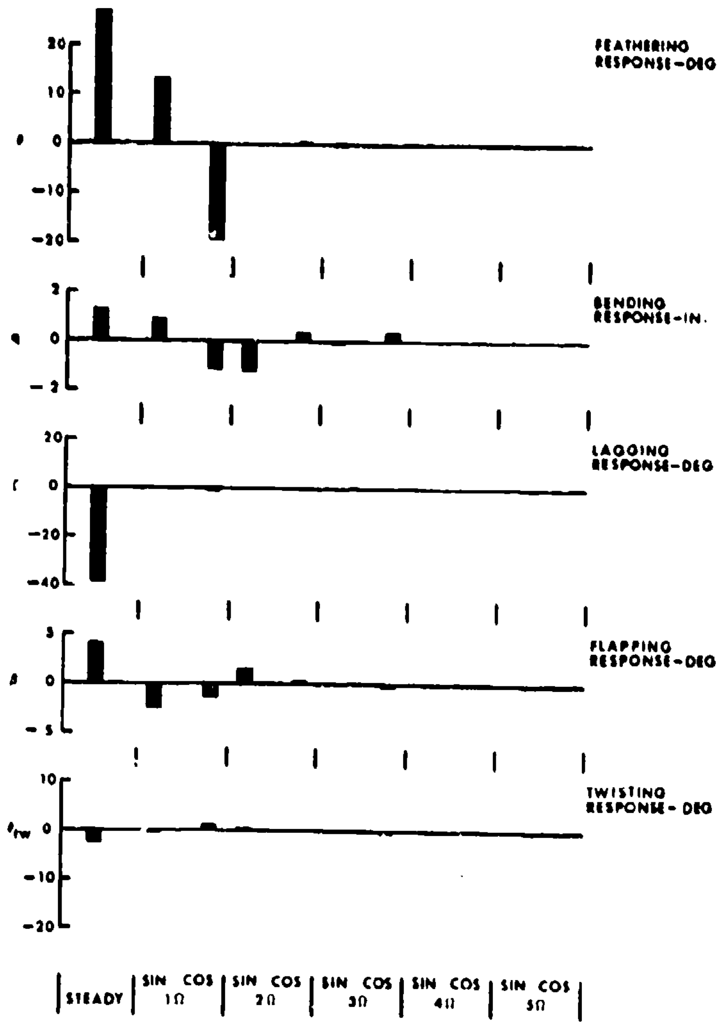

Figure 141. Normal Response Mode Harmonic Analysis for the 4-Bladed DCRa3 Configuration; V = 180 Knots; η_z = 1.0; Case No. 845-9.

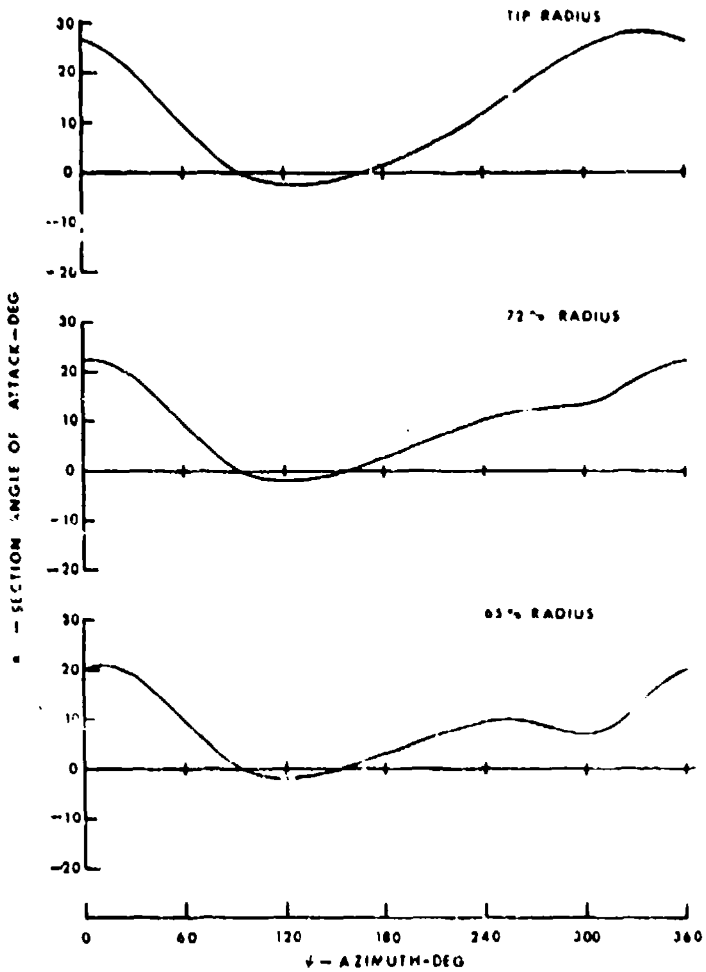

Figure 142. Angle-of-Attack Time Histories for the 4-Bladed DCRa3 Configuration; V = 180 Knots; η_z = 1.0; Case No. 845-9.

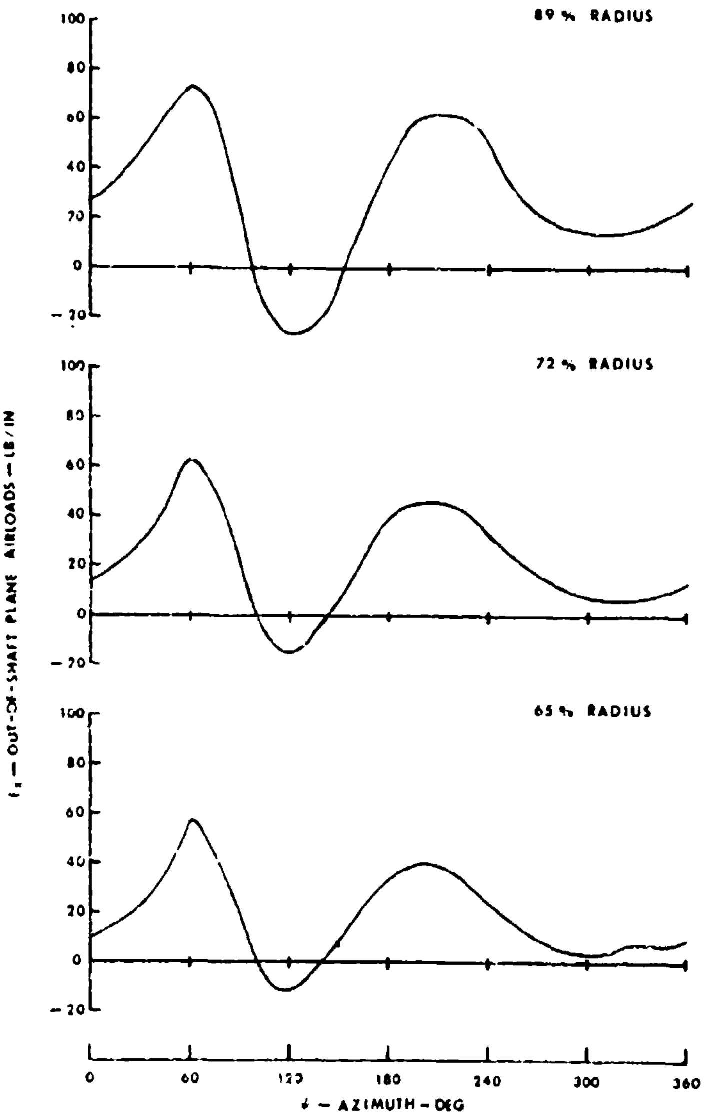

Figure 143. Out-of-Shaft Plane Airload Time Histories for the 4-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 845-9.

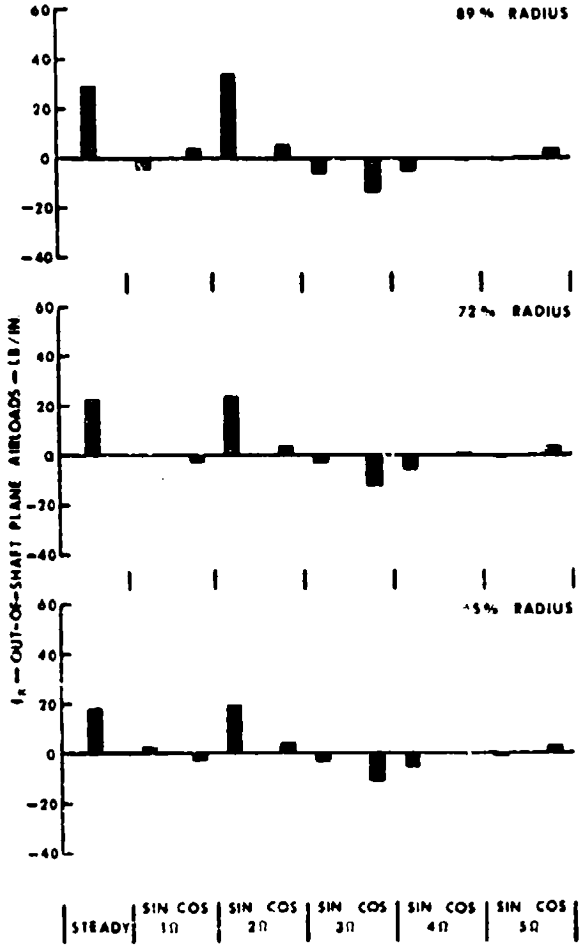

Figure 144. Out-of-Shaft Plane Airloads Harmonic Analysis for the 4-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 845-9.

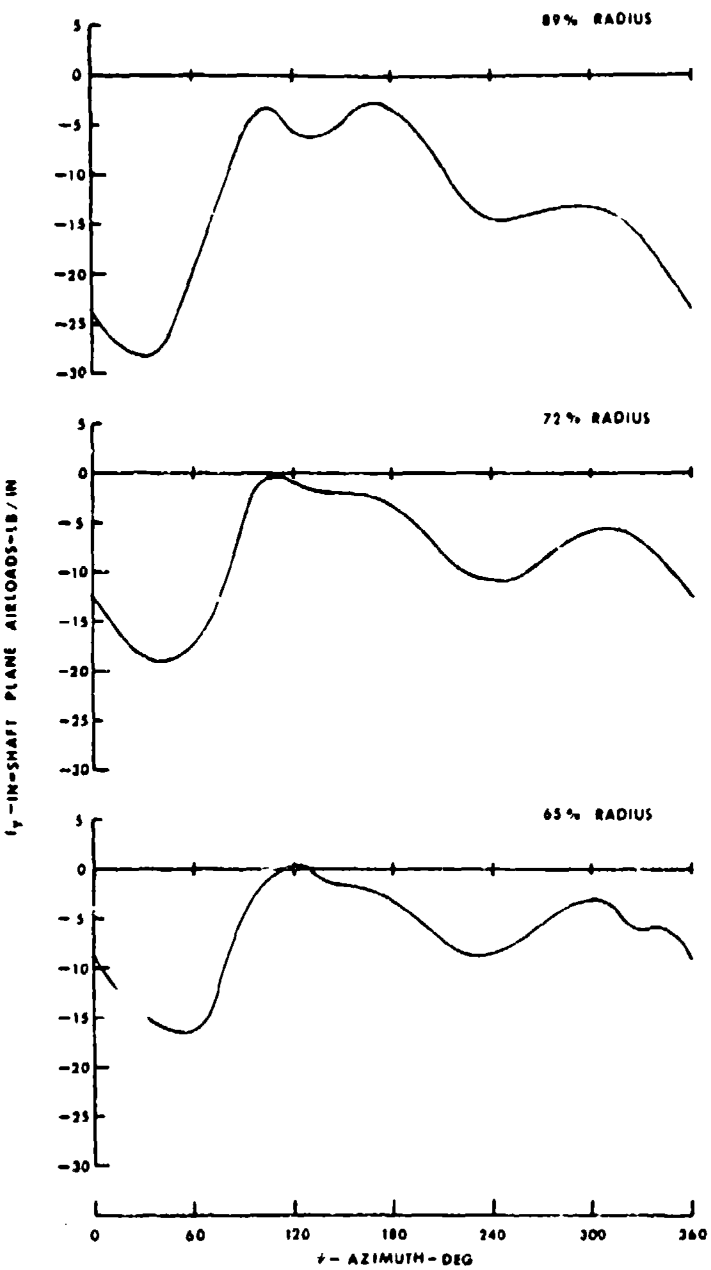

Figure 145. In-Shaft Plane Airload Time Histories for the 4-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 845-9.

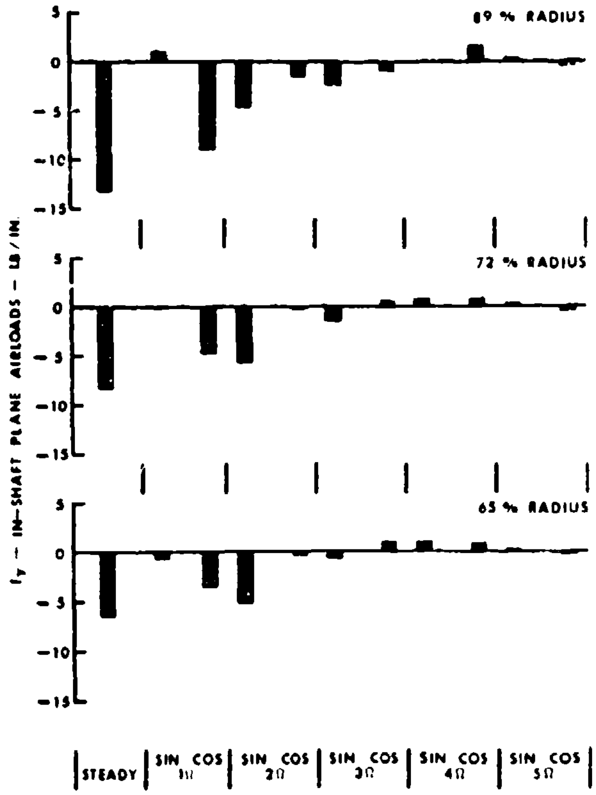

Figure 146. In-Shaft Plane Airload Harmonic Analysis for the 4-Bladed DCRa3 Configuration; V = 180 Knots; n_z = 1.0; Case No. 845-9.